John Crawford,
M. D.

THE

MEDICAL REPOSITORY,

AND

REVIEW OF AMERICAN PUBLICATIONS

ON

MEDICINE, SURGERY,

AND THE

AUXILIARY BRANCHES OF PHILOSOPHY.

CONDUCTED BY

SAMUEL L. MITCHILL, M. D. F. R. S. E.

One of the Physicians of the General Hospital, Representative in Congress for the City of New-York, Secretary to the Agricultural Society, &c.

AND

EDWARD MILLER, M. D.

Our great quantity of books looks like superfluity; which, however, is not to be remedied by destroying those we have already, but by publishing more good ones, that, like the serpent of Moses, might devour the serpents of the enchanters.

Lord Bacon.

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VOL. V.

NEW-YORK:

Printed and sold by *T. & J. SWORDS*, Printers to the Faculty of Physic of Columbia College, No. 99 and 160 Pearl-street.

1802.

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UNIVERSITY OF MARYLAND

MEDICAL REPOSITORY.

Vol. V.—No. I.

ARTICLE I.

Case of Hydrophobia: *Communicated by Dr.* Philip Syng Physick, *of Philadelphia, to Dr.* Miller.

On the 28th of April, 1801, I was desired to visit Samuel York, a black boy, sixteen years of age, servant to Mr. George Thompson.—The account I received of his illness was, that the day before, towards evening, he complained of not feeling well; in consequence of which he took a draught of chamomile tea, and went to bed. Next morning he awoke in a considerable perspiration, and being thirsty, he rose earlier than usual, and went down stairs for a drink of water, but, in attempting to swallow it, his head was involuntarily thrown back from the cup: after this, he returned to bed, and his breakfast was sent to him, but he refused to take any. His mistress prepared some sage tea, and intreated him to drink some of it: his answer was, that, to oblige her, he would take one tea-spoonful; and this, with great difficulty, he accomplished. In the course of the day he was persuaded to take four or five tea spoonfuls more into his mouth, most of which he was unable to swallow.

My first visit to him was at about half past eight in the evening of the second day of his disease. I found him uneasy and restless, throwing himself about in every direction, and talking incessantly. On being asked what was the matter, he complained of his throat, of a burning sensation in his stomach, and said he was thirsty; he thought he could drink a gallon of water, but that whenever he attempted to swallow, he felt a pain in his throat, "that seemed as if it would take his breath away."

Not suspecting the nature of his complaint at first, I examined his throat, supposing I should find it considerably in-

flamed; he objected strongly to this examination, and would scarcely allow the handle of a spoon to enter his mouth, to hold down his tongue. With some difficulty I obtained a view of his fauces, and found them entirely free from inflammation. I now offered him some water in a glass. He took it into his hand, but as soon as it was within a foot of his mouth, jerked back his head convulsively, and his countenance expressed marks of great horror. Notwithstanding this, he was prevailed upon to repeat the attempt, which produced similar effects. He now desired a lime to be brought him; the juice of which he squeezed into a spoon, and sipped down, with great difficulty, a small quantity of it.

His pulse was full, hard, and preternaturally frequent—his skin hot and dry—bowels had not been opened for two days—℥ xvj. of blood were taken from his arm, and an antimonial emetic ordered. The small quantity of it which he was able to take, vomited him once, and procured two stools.

Third day (29th April), 9 A. M. Has passed a very restless, uneasy night, without any sleep. All his symptoms continue, and his dread of water seems augmented. Some milk was offered him, which was equally offensive: indeed, he appears much distressed when any thing whatever is suddenly presented to him. In taking out my handkerchief, it happened to fly before his face, and this produced the same convulsive motion of his neck and throat as the sight of water. He objected to having the window open, on account of a stream of air which rendered him uneasy.

Sixteen ounces of blood were taken from his arm. About one o'clock, he was visited by Dr. Rush, and he directed him to be bled again. At this bleeding he lost ℥ xiv.—℥ ij. of strong mercurial ointment were rubbed upon his skin, and four grains of calomel, in pills, ordered, which, however, he was unable to take.

At 4 P. M. I invited Doctors Mease and De Wees to see him with me:—His pulse now intermitted irregularly, and was tense. At this time ℥ xx. more blood were drawn; by which the force of his pulse was considerably reduced, and it was made very frequent. His stomach became sick, and he called for something to puke in: the nurse carried a chamber-pot suddenly before his face, which caused him to start back as if gasping for breath; he knocked it out of her hand with great violence, and broke it to pieces against the opposite wall of the room. He spits very frequently a small quantity of thick white saliva—he was persuaded to attempt to swallow

it, but this occasioned him a return of the spasms—has had one watery stool to-day.

Nine o'clock, P. M. It has been ascertained beyond a doubt, that this boy was bitten in the foot by a mad dog about five weeks since; the dog bit also a maid servant the same morning, and snapped at a third. The uneasiness of my patient to-night is as great as ever, though he has been able to take several tea-spoonfuls of water—not, however, without having the spasms excited each time: says he is better—pulse very frequent and tense. Several medical gentlemen visited him this evening: he complained of great uneasiness from having six persons at once in his room—was bled ℥xii.—after which he became fainty, and spat up much frothy, viscid saliva, which appeared almost to choak him. He now insisted on getting out of bed.

It was intended to apply sinapisms to his throat and legs, and blisters to his thighs; but, before they could be prepared, he died suddenly at 10 o'clock, as if suffocated.

Next morning (30th), at 10 o'clock, leave was obtained to open the body. The pharynx, larynx, and trachea were first examined. They appeared in a natural state, quite free from inflammation. On the inside of the trachea, one part appeared rather more red than the rest. The abdomen was next opened; externally the viscera of a natural appearance—the stomach considerably distended with air; when cut open, was found nearly empty. Some small specks of a brownish coloured mucus adhered to its inner surface, at the great curvature, near the pylorus. On removing this mucus, the villous membrane under it exhibited a very faint red colour, hardly amounting to inflammation. The gall-bladder contained natural bile.

In the thorax were observed no marks of disease. The lungs were found free from adhesions, and in every respect perfectly natural

Reflecting on the symptoms which took place in the case above related, it appeared to me, that the dread of water arose chiefly from the convulsive or spasmodic contraction of the muscles of the glottis, which rendered the patient unable to breathe, and involved him in all the horror of impending suffocation. When asked why he could not drink, he answered, that whenever he attempted to swallow any thing, it "took his breath away."

Perhaps the reason why swallowing liquids is more difficult to such patients than swallowing solids, is, that in the former case the glottis must be completely closed by the action of its

muscles, whereas, in swallowing solids, the epiglottis is pushed down mechanically, so as to cover that aperture as much as is necessary, and, of course, little, if any muscular action is requisite. Now, in this disease, whatever occasions the muscles of the glottis to contract, will excite spasmodic action in them, owing to their diseased disposition, and hence a danger of suffocation is experienced, which eventually takes place from this cause.

The black boy, whose case I have related, was unable to swallow his saliva without having the spasms excited, which induced him to spit it out continually. To this constant spitting I attribute the burning sensation, which he felt at an early period of his disease; and I have myself experienced it from a similar cause.*

Will not this circumstance, together with the irritation which excessive thirst must occasion in the stomach, sufficiently account for the slight inflammation observed in this organ on dissection? We know, that in animals, starved to death, the stomach is found much inflamed, and it must be remembered, that want of drink is far more intolerable than want of food.

Under the influence of these opinions, I am disposed to believe, that *Tracheotomy* would have saved my patient, at least for a time, if it had not altogether prevented the fatal termination of the disease. Probably, had this operation been performed, he would have been able to swallow drink and medicine; because there was no action in the pharynx or œsophagus preventing deglutition, when the patient could summon resolution sufficient to attempt it.

I cannot suppose that the spasms of the muscles in hydrophobia would be attended with much danger to life, were it not for their influence in suspending respiration; because we see, occasionally, more muscles in other parts of the body affected with spasm, without any risk whatever being incurred by the patient, even though they may continue many days. It is possible, however, that the inflammation of the stomach, excited by excessive thirst, may also be a cause of death. Cases are recorded of persons afflicted with hydropho-

* In the year 1798, when at the City Hospital, being apprehensive of inconvenience from swallowing my saliva (supposing it to be contaminated with the nauseous effluvia of the sick), I made it a constant practice to spit it out—in consequence of which, I was distressed with a burning sensation in my stomach, that forced me to desist from this practice to procure relief. Of this I made several experiments, so as to ascertain it beyond a doubt; and my friend and colleague, Dr. Cooper, experienced the same.

bia for several days, who, some short time before death, were able to drink freely—probably such persons, after the cessation of the spasms, die of inflammation of the stomach.

After tracheotomy has been performed, it is likely that bleeding, blisters, and mercury, would answer the purpose of removing spasms, or any inflammation which may have taken place.

ARTICLE II.

An ACCOUNT *of the* SALUTARY EFFECTS *of a* SALIVATION, *and also of* TONIC REMEDIES, *in* PULMONARY CONSUMPTION: *In three Letters to Dr.* EDWARD MILLER. *By* BENJAMIN RUSH, *M. D. Professor of the Institutes of Medicine and of Clinical Practice in the University of Pennsylvania, &c. &c.*

LETTER I.

DEAR SIR,

ON the 17th of December, 1800, William Kairns, a sailor, aged about 26 years, was admitted into the Pennsylvania Hospital, in the second stage of Pulmonary Consumption. Several of this man's relations had died of that disease. As his pulse was active, I ordered eight ounces of blood to be drawn from his arm the day but one after his admission, and the same quantity to be taken five days afterwards. I directed him to live chiefly upon milk and vegetables, and to take a medicine, known in our hospital by the name of "Antimonial Powder," composed of fifteen grains of nitre, a sixth part of a grain of tartarized antimony, and half a grain of calomel, three times a day. Contrary to my intentions, sixteen doses of this powder brought on a salivation, the effects of which were as unexpected as they were agreeable. It suddenly put a stop to his cough, and removed every other symptom of his pulmonary disease. The salivation continued, without any additional doses of calomel, for ten days. I looked with a good deal of apprehension for a return of his consumptive symptoms after the spitting had ceased, but happily without finding them. In a week after his mouth and throat recovered from the mercurial disease; and he earnestly solicited his discharge, as a vessel was about to sail from our port, in which he was anxious to enter as a sailor. He was accordingly discharged, as cured, on the 10th of January, 1801.

On the 17th of January, 1801, William Poole, aged twenty-three years, formerly a merchant's clerk, was admitted into our hospital, in the third, or apparently the last stage of the disease which has been mentioned. His cough was distressing, especially in the nights. He was much emaciated, and had frequent chills, with constant sweats: his pulse forbad bleeding. Encouraged by the accidental cure just related, I prescribed for him the antimonial powder, and ordered mercurial ointment to be applied to his sides and breast, in order to excite a salivation. In a few days I was highly gratified, by hearing him complain of swelled gums, and great pains in his teeth. From this time, his cough, fever, chills and sweats left him. To obviate the weakness and want of appetite induced by his disease, I ordered him to take an infusion of columbo root, with elixir of vitriol, and to drink freely of wine and porter with his aliment, which I directed to be of a cordial nature, and from which he found great benefit. The salivary glands were not affected by the mercury in this patient; an effect of it which experience has taught me not to be essential in all cases to its salutary operation, in abstracting disease from internal and vital parts of the body. After this man recovered from his pulmonary symptoms, he was attacked by an obstinate and distressing rheumatism in one of his legs, which yielded to blisters, and the usual remedies for that form of disease. He was discharged, cured, on the second of last May.

It was not in the winter 1801 that I first combated pulmonary consumption with mercury. I had frequently, many years ago, attempted to cure it by a salivation, but without being able to excite it. The late Dr. Thomas Bond, of this city, I have been informed, was equally unsuccessful with myself, in his attempts to cure this disease by the same revolutionary remedy. The knowledge that has been acquired by the more extensive and familiar use of mercury since our first pestilential year, 1793, has, I hope, taught me the cause of our failures. It was probably given before the morbid action of the blood-vessels was reduced by blood-letting and low diet; or, 2dly. After the suppurative action in the lungs was so far advanced, as to prevent the action of the mercury predominating over it. Mr. Bogue takes notice of the failure of mercury to excite a salivation in the diseases of the liver from the same cause. Perhaps a third cause of our want of success may be derived from our having given the mercury, after all the excitability of the system (on which medicines act) had been wholly expended; or, 4thly, from our not giving it with some

other medicine, calculated, by its previous or accompanying stimulus, to prepare the system for its impression upon the mouth or salivary glands; or, lastly, from our not giving it in a form, as in the antimonial powder, in which it is diffused through the mouth in the act of swallowing it.

I have said nothing of the state of the lungs in the above patients, previous to the healthy and happy change induced in them by the salivation. It is probable they were affected with tubercles or ulcers; both of which, I believe, have been cured by other remedies besides mercury; but if those consequences of pulmonary consumption did not exist, such a preternatural secretion and excretion of morbid matter had taken place in the lungs, as would have produced death as certainly as tubercles or ulcers when not opposed by medicine.

It is remarkable, that we have limited a salivation to an inflammation of the liver, as improperly as we have limited blood-letting to a pain in the side. There is no more reason why the former should not be prescribed as generally in diseases of all the internal and vital organs, than that the latter should not be used in diseases of great morbid action in every part of the body.

The success of this new mode of attacking pulmonary consumption will depend very much upon the *time* and *manner* of applying it. How *long*, and how *often* have blood-letting, bark, opium, and blisters deceived us in the most simple cases, by our not regulating our prescriptions of them by the stage of the diseases in which they were indicated, or by the varying states of the system? It is from ignorance, or inattention to these two circumstances, that we so often see such different issues of diseases from the use of the same remedies in the hands of different physicians.

I have only to add to my letter, that a patient should not be considered as safe or free from danger, after the removal of the cough, fever, and other symptoms of consumption, by means of a salivation. The general weakness which predisposed to it, should be obviated by journies, sea voyages, a long course of tonics, and a total abstraction of all its remote and exciting causes.

From, dear Sir, your sincere friend,

BENJAMIN RUSH.

Philadelphia, March 18, 1801.

LETTER II.

DEAR SIR,

SOON after writing the above letter, an event occurred which made it necessary for me to delay sending it. William Kairns (whose case I have related), in his passage down the Delaware, in the month of February, caught a severe cold, from being detained several weeks by the ice. He was sent back to our hospital on the second of March, where he died on the 29th of April following. Dr. Parke, who succeeded me in attending the hospital, politely attempted to relieve him at my request by a salivation, but without success. If the death of this man should lead physicians to be more careful in enjoining their patients, after the cure of a pulmonary affection, to obviate the return of it, by avoiding all the remote and exciting causes of a relapse, and to use such remedies as are best calculated to remove the remaining debility of the system, it will not have occurred in vain. I have lately seen *Poole*, and was delighted to find him in good health, and fine spirits. He had gained not only flesh, but fat.

Within the course of the present month, I have arrested this formidable disease, by gently touching the mouth with calomel, in two young ladies in our city, who were affected with alarming catarrhs, which had supervened previous debility of a long standing. They are both now riding in the country, by my advice, in order to remove the debility from their systems, which was the forerunner of their disease.

Dr. Stewart, an intelligent young physician of this city, has lately put into my hands, the history of a case of a Mrs. Cornvil, a woman of five and twenty years of age, whom he had cured in the spring of 1799, of a confirmed pulmonary consumption, by means of a salivation of five weeks continuance. The salivation, he remarks, was sometimes interrupted by a diarrhœa, and by great morbid excitement in the blood vessels, but was always restored by checking the former, by means of laudanum, and reducing the latter, by means of blood-letting. The Doctor concludes his letter, which is dated May 12th of the present year, by saying, "Mrs. Cornvil is now free of all pulmonary complaints, and has (since her cure) become the mother of a fine healthy child." Dr. Physick informs me, he has salivated two patients in consumptions, with success, and has hopes of curing a third, now under his care, by the same remedy. Thus have we made one more impression upon a most formidable and distressing disease. Let us

not despair; and when we speak of an incurable disease, let us always remember, that we only express the imperfection of our knowledge in medicine.

From, dear Sir, your friend,

BENJAMIN RUSH.

Philadelphia, May 20, 1801.

LETTER III.

DEAR SIR,

IN my last letters, I mentioned the effects of a salivation in pulmonary consumption. The subject of the present letter shall be, the effects of tonic remedies in that stage of consumption which forbids the use of depleting remedies, and in which mercury is ineffectual, from the exhausted state of the excitability of the system.

In the month of December, 1800, Benjamin Parker, aged twenty-six years, was admitted into the Pennsylvania Hospital, in the last stage of pulmonary consumption. He was unable to sit up in his bed. His expectoration was copious and purulent, and his pulse weak and frequent. Without any expectation of curing him, I prescribed a cordial stimulating diet, brandy toddy, liquid laudanum in small doses during the day, and from two to four grains of solid opium every night at bed time, and all chiefly with a view of smoothing his passage out of life. In my visits to the hospital after this prescription, I frequently passed his bed, without giving him the trouble of offering me his pulse. In the course of two weeks, Mr. Huchinson, one of the apothecaries of the hospital, informed me, with a smile, that Parker was much better. From this time I became more attentive to him, and had the pleasure of finding his countenance and pulse improving, and his cough lessening every day. By persevering in the use of the above remedies for six weeks, he recovered his strength and flesh, and was discharged on the 28th of February, without a single symptom of pulmonary consumption. This man had been a private patient of Dr. Caldwell before he was sent to our hospital. After his recovery, I asked the Doctor how long he thought he would live after he ceased to attend him? He replied, "not more than two weeks." I should have hesitated in communicating this case to you, had not every circumstance that has been related been witnessed by upwards of a hundred students of medicine who attended the practice of the hospital during the last winter. However extraordinary this cure may appear,

it was not the first time I had seen similar good effects from tonic diet and medicines. I prescribed them for a sailor of the name of Prichard, in the spring of the year 1776, at his own house, and left him afterwards, expecting he would live but a few weeks. In a few months I saw him seated on the bench of one of the gondolas, which were employed to defend Philadelphia in the revolutionary war. We recollected each other. He informed me that he ate his allowance, did his duty as a gondolier, and slept every night in the open air upon a blanket under his bench. I saw him a year afterwards in the street in good health. Perhaps his exercise in rowing for several months on board the gondola, contributed to render his cure more complete.

If these two cases stood alone in the history of chronic diseases, they would be sufficient to teach us, never to abandon patients in cases apparently the most hopeless, without a parting effort to relieve them. They show further, that the remedies which are calculated to lessen the pains which sometimes accompany the passage out of life, generally give the patient the best chance of recovery.

From, dear Sir, your friend,

BENJAMIN RUSH.

Philadelphia, June 19, 1801.

ARTICLE III.

TRIALS *with* NITRIC ACID *in* VENEREAL DISORDERS, *in which its Value therein is attempted to be ascertained: In a Letter from* JOHN R. B. RODGERS, M. D. *and Professor of Midwifery and Clinical Medicine in Columbia College, to Dr.* MITCHILL, *dated New-York, April* 8, 1801.

DEAR SIR,

WHEN I first heard of Nitric Acid having been used for the cure of Syphilis in Great-Britain, I determined to try it in the New-York Hospital, and in my private practice. During my attendance on the Hospital in the winter months, from December 1797, to this spring, and elsewhere, I have directed it in a great variety of syphilitic and other cases. I generally began with fifty drops in a pint of water, with one ounce of syrup, to be

taken in a day. This dose was increased to ʒ iss. and very often to ʒ ij. and more, in a day. Of the several cases I shall particularize but a few. In one syphilitic patient in the New-York Hospital, of recent infection, the præputium penis had an ulcer on its upper edge, of the size of a small sixpence; it was of sordid appearance—he had not taken any medicine for his complaint. The nitric acid was used in the dose of a drachm a day for four days, and then gradually increased to ʒ ij. and continued at this latter dose for five or six days. The ulcer was treated only with common and mild dressings, to determine more precisely the effect of the internal remedy on the ulcer. The sore extended itself daily, and, by the end of the first week, it had covered nearly one half of the prepuce. It was now judged necessary to apply something to arrest this ulceration. The phagedænic wash of the house was used, and the progress of the ulcer only impeded, but not completely stopped. After using the nitric acid for fourteen days from its first exhibition without effect, the patient was put on the use of the muriate of mercury, with a small quantity of opium, and the compound decoction of the woods. In five days after the commencement of this course, he was manifestly better, and in a month he was discharged, cured. This patient was of a sanguine temperament. A man, who lay in the next bed to the one we have just mentioned, had been long in the use of mercury—he had been terribly afflicted with syphilis—had a large open ulcer in his groin, from a buboe, and several ulcerations in different parts of his body—had been salivated before his coming to the hospital—was languid and relaxed, and had a pallid countenance. I continued his use of mercury and opium some days, but his sores did not show any tendency to heal, and he was evidently growing worse. I then put him on the use of nitric acid, and, in a week's time, his general health was much advanced, his countenance was more florid and animated, his muscles, which before were flabby and relaxed, became braced and firm; his ulcers and foulness of the skin were much diminished, and in a few weeks he was cured.—I should remark, that before we began the use of nitric acid, we suffered him to be four days without any medicine but his anodyne; and that, although he had not shown any symptoms of ptyalism before, or at the time of beginning the use of the acid, yet, in five days after we entered on its use, his mouth was very sore, and he spat freely. In several cases where there were ulcers of long continuance, blotches on the skin, and extensive herpetic affections, with pains increased when warm in bed, and

where mercury had been before given with little or no advantage, the nitric acid was administered with the best and happiest effect; but in many cases of recent syphilis (and several of them occurring this last winter), and chiefly in young and hearty men, the nitric acid, though given in different doses, and persevered in a considerable time, did not produce any good effect; and in the same patients, the use of mercury, with our usual accompanying remedies, readily accomplished a cure.

Having seen, in the London Medical and Physical Journal of May last, an account of nitric acid and opium being successfully used in a case of dysentery, I tried it the last winter on a man just come from the State Prison, after a confinement of more than three years, and who had been nearly all that time sick—he came in with diarrhœa of long standing, extremely emaciated and reduced in strength—abdomen much enlarged and tense, and evidently containing fluid—he had great thirst. The nitric acid and opium, as recommended by Mr. Hope, were administered, but with an increase of opium, according to the following prescription: viz. ℞. Gum. op. gr. iv. acid. nitric. ʒ ij.—Aq. fontan. ℥ iv.—capt. cochl. mag. 1. 4ta quaq. hora—He took, at the same time, wine, and had his abdomen frequently rubbed with warm oil. After a few days he passed urine profusely, and the swelling of his body was entirely removed, so as to permit one to feel his spleen and liver very distinctly and much enlarged—the thirst was but little relieved—his diarrhœa was, for a short time, checked—it, however, soon returned, and he died. This prescription of Mr. Hope promises to be of service in old diarrhœas of hot climates, and in long protracted dysentery. I had used nitric acid as an auxiliary to digitalis before I saw an account of its being applied to that purpose in one of the Medical Journals. It was in the case of a young lady who had taken digitalis so as to affect her pulse very sensibly, and to induce a vertiginous affection of the head. She was languid, and her countenance pale, and her lips less red than usual. She had become disoxygenated. Nitric acid was given, and with advantage.

From what I have stated above, and from what I have witnessed in other cases, I am induced to believe, 1. *That nitric acid is not to be relied on as an anti-syphilitic remedy, especially in recent cases, and where the patient is of the sanguine temperament; but that it is of the greatest service in all debilitated and disoxygenated constitutions, where, from the long use of mercury, the system has taken on the habit of great*

irritability, and where the patient may be said to be MERCURIALIZED. 2. Where there have been congestions in any part of the glandular system previous to the body being affected with syphilis, or where there is any tendency to scrophula, and where the disease has affected the skin. 3. In all herpetic complaints, syphilitic or otherwise; and in all cutaneous diseases where the skin is in a state of indirect debility, as in inveterate psora, or after small-pox, measles, or scarlatina, it is of service. 4. In ulcers and complaints of the throat of long continuance. 5. It is extremely well adapted to that state of languor and debility which patients are in returning from southern climates, and who have felt the effects of tropical fevers, of dysentery, and of long voyages. 6. In all those who have diseased livers and anasarca, either separate or combined, it is an excellent remedy. 7. It is also a good remedy in chlorosis. 8. From a case above cited, it is with opium a diuretic. Lastly. It does not appear to exert its good effects where the system is in much tone, or where that disposition obtains which is called inflammatory; but where the body generally, or a particular part, has been much debilitated by the long exertion of disease or influence of medicines.

I am, with much esteem,
Yours sincerely,
J. R. B. RODGERS.

ARTICLE IV.

A CASE *of* PULMONARY CONSUMPTION *cured by the Use of the* DIGITALIS PURPUREA: *In a Letter from* JOHN SPENCE, *M. D. of Dumfries (Virg.), to Dr.* MITCHILL, *dated January* 26, 1801.

June 18, 1800.

JAMES DRINAN, aged 31, a man of low stature, of a pale complexion, with a narrow chest, and dark coloured hair, and by trade a shoemaker, labours under a severe cough, attended with a copious expectoration of gross, yellow-coloured matter, which smells very offensively. The cough attacks him frequently during the day, but is most troublesome during the night, and in the mornings: feels little pain in his breast or side except when he coughs: observes, when seized

with a violent fit of coughing, that the matter he expectorates towards the close of the fit is tinged with blood, and tastes saltish: says he can distinctly trace the matter coming up from the short ribs on the right side: complains of being frequently very chilly, particularly in the evenings; and the chilliness he experiences has been so remarkable, that a few days ago, when Fahrenheit's thermometer stood nearly as high as 90 in the shade, he was obliged to cover himself with a blanket. These chills are succeeded by a high fever and profuse sweats. His appetite is bad, tongue foul, pulse hard and strong, and varies from 80 to 100 strokes, and upwards, in the minute: urine high-coloured: is of a very costive habit.

About the beginning of last month he was attacked with a pain in his right side, difficult breathing, and a very troublesome cough. For these complaints he was bled and blistered twice—took cooling purges—James' fever powders—and, in every respect, pursued attentively the antiphlogistic course. All his symptoms were thereby relieved, excepting his cough, which was harassing. About the first of June he suddenly expectorated a great deal of matter, the odour of which was excessively disagreeable, insomuch that scarcely any person could stay in the room with him. On the tenth of the same month all his symptoms became worse, accompanied with rigours, which were followed by fever and wasting sweats.—All this time he adhered rigidly to a low diet, living almost entirely on strawberries and milk, and rode out every day. When he rode he did not suffer his horse to go out of a walk or pace. He likewise, by the advice of a neighbour, drank a great deal of *horehound tea*. Notwithstanding, however, all his care, debility and emaciation of body became daily more alarming; and so restless were his nights, and so distressing his cough, that he was obliged to have recourse to opiates in large doses. From these circumstances, as well as from his profuse sweats and great expectoration, he was so convinced that his dissolution was rapidly approaching, that he deliberately settled his affairs; and he was the more disposed to give into this persuasion, as most of his relations had gone off, he said, in the same way.

He has resided several years in Dumfries (Virginia), and conducted himself with great sobriety and industry. He has generally enjoyed good health, except that he has frequently been attacked with slight catarrhal affections; and then his cough, though troublesome, was never dangerous.—Although a shoemaker by trade, he has not, for many years,

been engaged in the laborious part of that business; having a shop of his own, with a great number of journeymen, for whom his sole employment is to cut out work.

To-day I advised him to try the digitalis. He very cheerfully embraced my proposal.

I directed him to begin with thirty drops of the saturated tincture in a wine-glassful of mint tea, and to repeat this dose every forenoon and afternoon. At the same time I directed him to ride out every morning if able, and still to adhere to the antiphlogistic regimen. He was likewise directed to keep his bowels open by means of aloetic pills.

Friday, June 20th.—He took his medicine yesterday as directed. No nausea excited by it, nor any change in his pulse.

To-day he took forty drops of the tincture, and soon after rode out, when, unfortunately, his horse ran off, and threw him; in consequence of which he has been attacked with very sharp pains in his side, and a severe spitting of blood, for which he has been copiously bled.

Saturday, 21st.—He has had a bad night: has expectorated a great deal of blood during the night; and this morning, he says, he coughed up a vast quantity of corruption, of a most offensive nature.—As he feels no uneasiness from the drops, he insists upon taking them in much larger doses, observing that no time is to be lost.

Six o'clock P. M. Has taken eighty drops of the tincture twice to-day, without exciting nausea. His pulse, however, is now as low as 66 strokes in a minute.

Sunday, 22d.—Sweated profusely last night: slept ill: has coughed up a good deal of matter this morning.

Seven o'clock P. M. Has taken 100 drops twice to-day. No nausea: pulse about 60: cough not so troublesome. Again rides out.

Monday, June 23d.—Six o'clock P. M. Having been obliged to visit a patient in the country to-day, he had the boldness to venture upon three doses of the tincture, an hundred and ten drops in each dose, in my absence. No nausea, however, was produced by the medicine; but he observed his pulse as low as 54 and 58. Says he has felt no pain in his side. His cough is easy; but what he expectorates is still offensive.—Directed not to exceed 110 drops at a time.

Tuesday, 24th.—Seven o'clock P. M. Has taken two doses of 110 drops to-day. No nausea: pulse as yesterday: sleeps better.

Wednesday, June 25th.—Seven o'clock P. M. Took 110 drops half past eight o'clock this morning, and another dose half past twelve; soon after which he felt very sick, and sent for me. I found him lying a-bed, complaining of great nausea; and it was with difficulty he could prevent himself from puking. His skin was very cool, and his pulse beat precisely 45, and was full and soft; and, at this hour (seven o'clock in the evening), it continues to beat nearly the same number of strokes in the minute.

Friday, 27th.—Took no drops yesterday, as the nausea continued; and his pulse did not exceed 50. No fever nor sweat last night. Observes that he makes a great deal of water; and, what he thinks extraordinary, from being of the colour of brine, it is now perfectly clear. His stools, too, he observes, are so dry that they crumble to pieces like dry clay.

His diet still consists of milk and vegetables, and he indulges freely in ripe fruits.

Has been obliged to take opening pills frequently.

Saturday, 28th.—Slept well: has coughed very little this morning. Took only one dose of 100 drops of the tincture yesterday, which occasioned a distressing nausea all day, and kept his pulse low.

There is an eruption all over his body like the prickly heat.

Sunday, 29th.—Has passed a good night. No return of any pain in his breast or side. Little cough: little expectoration, and not offensive.

Took three doses of the tincture yesterday, 100 drops in each dose, without immediately exciting nausea; but this morning he has been very sick at his stomach. Thinks this nausea relieved by drinking a little hyson tea; and had a keen appetite for his breakfast, which is remarkable.

About half an hour before he got out of bed to-day he counted his pulse accurately, when it beat only 38 strokes in the minute; and at this hour (ten A. M.), though he has been walking about, it beats exactly 50, and is very soft.

Omit the tincture to-day.

Tuesday, July 1st.—Has slept well these two nights. Continues to mend. Rode eight miles this morning. Takes 100 drops of the tincture once a-day, which keeps his pulse under 60. He is directed to ride out every morning, to avoid all bodily exertions, to continue his vegetable diet, and to take the drops only every second or third day, or what is just sufficient to keep his pulse moderate.

July 20th.—He has been taking the fox-glove as directed, but finds himself so entirely relieved from all his pectoral complaints that he begins to leave it off. From the 22d of June to this date his pulse has never exceeded 60, excepting at one time, when he imprudently engaged in very active exercise.

November 1st.—Since last report he has enjoyed perfect health. For ten weeks past he has taken none of the digitalis, and now eats meat freely. Of late he has been remarkably drowsy, and says it requires some exertion to keep awake. Since he began the fox-glove he has taken no preparation of opium—indeed, no other medicine except aloetic pills occasionally.

January 24th, 1801.—He continues to enjoy good health, and, at present, is fatter than he has been for many years.

The tincture used in the above case was prepared as follows: Two ounces of fox-glove, nicely dried, were coarsely powdered, and infused, for forty-eight hours, in half a pint of French brandy, and then passed through filtering paper.

ARTICLE V.

Practical Remarks *on the* Use *of* Digitalis *in* Consumption. *By Dr.* Spence, *in a Letter to* * * * *

Sir, *Dumfries, Dec.* 14, 1800.

I SHALL submit to your consideration a short but candid view, divested as much as possible of technical terms, of my present mode of exhibiting the digitalis in cases of pulmonary consumption; and, in doing so, for the sake of perspicuity, shall divide the disease into two periods—the incipient and advanced stages—and add a few general observations.

1. In the incipient stage of consumption, when there is considerable vigour of constitution, particularly if attended with active hæmorrhagy from the lungs, I push the use of the digitalis cautiously, but freely—that is, I try to reduce the pulse under 60 strokes in a minute, and maintain this depression for two or three weeks, notwithstanding there may be occasionally considerable and distressing nausea. At the same time I advise a milk and vegetable diet, with gentle exercise on horseback, or in a carriage, when the weather will permit;

and the use of the swing-chair, for an hour at a time, twice or thrice a day.—When the pains about the chest are *wandering*, I also advise the repeated application of blisters, and other stimulating plasters, to the breast and between the shoulders; but if the pain be *fixed*, I prefer the introduction of a seton as near the part affected as possible. My patient is also directed to drink moderately of emollient teas or tar-water, to be warmly clothed, to avoid cold and wet feet, and sitting up late at nights. All great exertions of the body, but particularly of the lungs, as singing or speaking loud, must also be carefully avoided.

2. In the second or more advanced stage of the disease, accompanied with a quick pulse and great general debility, the treatment is very different. The fox-glove must be so managed as to lower the pulse and moderate the fever, but never pushed to such an extent as to excite nausea or sickness at stomach.

A little experience will soon enable a judicious and attentive practitioner to ascertain the doses adapted to his patient's constitution; and, as soon as he has attained this knowledge, he must be persevering in the use of the medicine. At this period of the disease the patient's strength must never be suffered to languish. He must be supported by nutritious diet.—Agreeably to the present manners of society, two or three meals are taken in the course of the day; but this mode of eating is very improper with delicate constitutions—more food being generally eaten at such stated periods than is necessary, thereby causing great heat, accelerating the pulse, and throwing the whole system into commotion. The diet should be nourishing, and of easy digestion—such as jellies, broths, eggs boiled soft, oysters raw or moderately roasted: indeed, a bit of fowl, beef, mutton, or venison, when attainable, dressed *rare*, may be taken in small quantities every two or three hours throughout the day. This deviation from the present fashion of eating is indispensible, ample nourishment being thereby thrown into the system without exciting irritation. At the same time that I recommend solid food in this way, I forbid the use of spices, wine or spirits.

The same directions respecting local applications, and exercise, are equally applicable to this as to the incipient stage; and particularly the exercise of swinging: and care must be taken that the swing-chair be so constructed that the patient may be perfectly at ease, without being affected by fatigue or bodily exertions.

3. *Some general observations.*—Should a physician be anxious to predict the probable future effects of the fox-glove, I would request his attention to be particularly directed to the state of his patient's pulse. When there is a change from a hard and quick to a full and soft pulse, he may prognosticate flattering consequences.

I have, at present, patients taking this medicine in powder, tincture and pill; but to the last form I now give a decided preference. The pill is generally most agreeable to the patient, and less apt to create nausea.

In only one instance have I found it bring on numbness of the extremities, stupor, great lassitude, and a reluctance to move. This happened to a young lady who was very far advanced in a consumption when she commenced the use of the fox-glove. When under this influence of the medicine she had no cough, no pain, and her breathing was easy.

Dr. Adams, of Richmond, in this State, writes me, that a patient who was taking this medicine under my directions there, had his pulse reduced as low as 42, but then it beat irregularly.

Whenever these violent effects take place, the fox-glove must be omitted for two or three days, and then resumed in smaller doses.

It has only in one case proved laxative; but this was easily counteracted by combining it with opium, to the extent of a grain or half a grain in the course of twenty-four hours. I begin to think that these two medicines may be so combined and modified as to produce the finest effects in a variety of diseases, and particularly in the advanced stages of consumption; but as yet I have not had trials enough to authorise me to draw conclusions.

In most cases there has been a constipation of the bowels, which is easier, as well as more safely removed, by emollient injections than by cathartics. In such instances I recommended stewed prunes, and various preparations of rye meal.

In every case that has hitherto fallen under my notice, *where the patient could bear the medicine well*, I can assert that those colliquative or wasting sweats, so well known to physicians, and the constant and dreadful attendants of hectic fever, have invariably ceased as soon as the system was distinctly under the influence of the fox-glove.

In two cases of patients in the very last stage of the disease, who were extremely solicitous to make trial of the digitalis,

I found the tincture, powder and pill, even in very moderate doses, create such a distressing nausea, and so completely destroy the appetite, that I was obliged to forbid its use. In one of these cases I thought a light watery infusion of columbo-root, with a little orange peel, enabled the patient to bear the medicine somewhat better. It is, therefore, my present opinion, that no physician can pretend to form a justifiable prognosis, until he ascertains, on trial, how his patient's stomach will bear the medicine. My first patient, Drinan, fortunately experienced no uneasiness from large doses, excepting a temporary nausea; and I have now a young gentleman under my care, who lives about 100 miles from this place, with whom the digitalis seems to agree extremely well. From his last letter, dated January 15, I shall give a short extract; and here it may be observed, that he was obliged to spend the last winter in the West-Indies on account of his pectoral complaints, and has now been taking the fox-glove for more than twelve weeks under my direction:—

"At present I think myself in a good way. My appetite not so ravenous: my digestion as well as can be wished: the pulse, for some time past, early in the morning, from 44 to 50, varying through the day from 70 to 90, and sometimes, when under exercise, to 100. My cough, in the course of the twenty-four hours, not more than once or twice painful. —The only drink I *indulge* in at present is a little tar-water; but I am tired of it, and wish for a change."

The foregoing statement exhibits a general outline of my manner of administering the digitalis in consumptive cases, as well as the result of my present experience. How far my opinions and practice may concur with the opinions and practice of others I know not, having had no communications on the subject with any physicians, excepting with those who have almost implicitly followed my directions.

Before I close this letter, permit me, Sir, to observe, that although I am, perhaps, the first person who announced in the American newspapers a case of phthisis pulmonalis successfully treated by the use of the digitalis, yet I am far from thinking it a certain cure in every case of pulmonary consumption. In the early stages of the disease, where there is no mal-conformation of body, I believe it will prove a successful remedy; but where this mal-conformation exists, I think it will not cure; neither do I think it will effect a cure in the very advanced periods of the disease. But even in the

last and fatal stage, if the *stomach will bear the medicine*, it will mitigate distressing symptoms, and thereby tend to smooth the passage of the declining patient.

We know the Peruvian bark will not cure every intermittent fever; but is the bark, therefore, to be undervalued? "Could we obtain," says an able writer, "a single auxiliary for the fox-glove, such as we have, in many substances, for the bark, I should expect that not one case in five of consumption would terminate as ninety-nine in an hundred have hitherto terminated. But I believe a majority of cases will yield to simple fox-glove."

ARTICLE VI.

REMARKS *on a* LETTER *of the Rev.* ZECHARIAH LEWIS, *relating to a* SUBTERRANEAN WALL, *discovered in North-Carolina. By* JAMES WOODHOUSE, *M. D. Professor of Chemistry in the University of Pennsylvania, &c.*

TO THE EDITORS OF THE MEDICAL REPOSITORY.

GENTLEMEN,

IF Mr. Zechariah Lewis had seen my reply to the Rev. Mr. Hall's account of the celebrated subterranean wall of North-Carolina, published in the Medical Repository, vol. ii. p. 275, he could not have asserted, that the opinion that the wall was basaltic was hastily adopted, from a single corresponding property having been discovered between the stones composing the wall and basaltes. When he reads that reply, he will find various reasons brought forward in support of the opinion there advanced; several authors who have written on the subject in question quoted; an accurate analysis made of the external and internal part of the stones, and of what is improperly called the cement, and compared with the results of the experiments of Bergman, Mongez, and Faujas de Saint Fond, on the basaltes of other countries.

Having made these necessary observations, I will proceed to consider the arguments produced by Mr. Lewis, to prove, that the wall is a production of art.

First. It may be remarked, that the opinion that the wall was constructed by some enlightened antediluvian nation, or some civilized people, who may have wandered from the

eastern continent; or that it was built for the purpose of inclosing a prison, a garden, or a city; or that the small stream which runs near the wall was once a large river, and that the wall was erected to guard against the rise of its waters, has no foundation but in the imagination of the reverend writer.

Secondly. He thinks that the fine white powder, called cement, with which the wall is supposed to have been plastered, may have been manufactured from the shells of muscles, great quantities of which are found in the neighbourhood of the wall. Mr. Probly, he says, assured him, that he burnt the shells, dried the cement, and, upon comparing the two, could find no difference between them.

Muscle shells, exposed to the action of fire, are almost entirely converted into quick lime; but in one hundred parts of the cement, there is no more than five parts of this earth. Muscle shells contain no iron, but there is a considerable portion of this metal in the cement.

One hundred grains of these shells will not afford, like the cement, fifty-five grains of silex, sixteen of alumine, and three of magnesia. Mr. Probly has not favoured us with any chemical experiments, to prove that there is no difference between burnt muscle shells and the cement; the only proper method of proving a similarity between these bodies.

Thirdly. At a small distance from the wall, Mr. Lewis informs us, there is a species of clay resembling fuller's earth; of which the cement may likewise have been made. What is called fuller's earth, never turns of a white colour like the cement; and the clays of this country, with few exceptions, burn of a red colour. The cement retains its whiteness, when exposed to a heat insufficient to melt it. In order to prove that the cement is composed of fuller's earth, or this kind of earth mixed with burnt muscle shells, it will be necessary to show that a mechanical mixture of these substances gives the same principles by analysis as the cement.

Fourthly. He says the wall is perfectly regular, and has every possible appearance of an artificial production.

In my letter to Mr. Hall it was expressly mentioned, that the regularity of the wall was no proof of its being a production of art; for that the basaltes of Italy appear like piles of wood, of equal thickness throughout, and extend to a considerable distance.

The following account of the cave of Fingal, extracted from Garnet's tour through Scotland, will show how little the re-

gularity of the wall contributes to prove that it has been the production of a civilized people.

"As we turned the southern point of the island of Staffa, the basaltic pillars became vastly more regular, and the view of this side of the island was grand beyond conception: it appeared like the end of an immense cathedral, whose massy roof was supported by stupendous pillars, formed with all the regularity of art. Proceeding still further along the same side of the island, we had a view of Fingal's cave, one of the most magnificent sights the eye ever beheld. It appears like the inside of a cathedral, of immense size, but superior to any work of art, in grandeur and sublimity, and equal to any in regularity.

"Regularity is the only part in which art pretends to excel nature; but here nature has shown, that when she pleases she can set man at nought, even in this respect, and make him sensible of his own littleness. Her works are, in general, distinguished by a grand sublimity, in which she disdains the similar position of parts, called by mankind regularity, but which, in fact, may be another name, for narrowness of conception, and poverty of idea; but here, in a playful mood, she has produced a regular piece of workmanship, and on a scale so immense, as to make all the temples built by the hand of man hide their diminished heads."

Dr. Van Troil, speaking on the same subject, says—"This piece of nature's architecture far surpasses every thing that invention, luxury, or taste, ever produced among the Greeks."

Fifthly. An extract is made from the British Encyclopædia, to show that basaltes is always found standing up in the form of regular angular columns.

This is not true. The strata of the basaltes of some parts of France run in an horizontal direction.* Mr. Strange, in an essay published in the sixty-fifth volume of the London Philosophical Transactions, asserts, that they sometimes are found running in this manner.

Sixthly. He says there is nothing between the basaltic columns of other countries, resembling the cement of the wall.

This observation is not just. A cement of a beautiful white colour is found between the basaltic pillars, in the cave of Fingal.†

* Histoire Naturelle de la France Meridionale, par M. l'Abbe Giraud Soulavie, tom. ii. p. 52.

† Garnet's Tour through the Highlands, p. 224.

Seventhly. It is another property of basaltes, adds he, that it is fusible, *per se*, by a moderate fire. This is not the fact with the wall, consequently it cannot be basaltes.

To this I reply, that I have fused the stones of the wall, in half an hour, with the greatest ease, and that they melt into a black glass.

Eighthly. Neither stones, nor other mineral substances, our author informs us, are covered with rust, unless they have been exposed to the action of the aërial acid. On the supposition that the wall is basaltes, the individual stones could never have been exposed to the air. The stones are covered with rust, consequently the wall cannot be basaltes.

The first part of this observation is not accurate. Mr. Lewis has not proved, that the rust of the stones contains the aërial acid, which he ought not to have taken for granted. The word rust is a vague term, and conveys no precise idea to the mind. The brown ochreous matter, with which the stones are covered, has been formed by the agency of water, acting upon the iron they contain, which has decomposed or calcined them. The aërial acid has no action in the business. The same kind of rust is found on the basaltes of other countries.*

Ninthly. The stones composing the wall are certainly basaltic, as every mineralogist can tell by inspecting them, because they exactly answer the description of basaltes given by various writers; and because the white powder, improperly called cement, the external and internal parts of the stones, contain the same principles, and nearly in the same proportions as the basaltes of other countries.

I shall conclude this letter, by remarking, that the supposition that the North-Carolina wall has been constructed by an enlightened antediluvian nation, is as unphilosophical as the belief of some of the common people of Scotland, that the cave of Fingal is artificial, and was built by a race of giants, for their celebrated chief, Fion-Mac-Cool, the father of Ossian.

I have the honour to be,
Gentlemen,
Yours sincerely,

JAMES WOODHOUSE.

* French Encyclopædia, and Nicholson's Chemical Dictionary—article Basaltes. Vide also Fourcroy's Chemistry.

ARTICLE VII.

A COLLECTION *of* PHENOMENA, *relative to the Connection between* EARTHQUAKES, TEMPESTS, *and* EPIDEMIC DISTEMPERS; *and a* VINDICATION *of the* DOCTRINE *of* EQUIVOCAL GENERATION. *By* NOAH WEBSTER, *jun. Esq. in a Letter to Dr.* MITCHILL, *dated New-Haven, March* 2, 1801:

SIR,

IN the course of my studies I sometimes fall upon relations of unusual facts, which it may, possibly, be useful to place in your highly valuable Repository. The scraps that I send you are at your service; only do not insert them to oblige me—but let their publication depend on your own opinion of their value.

In my History of Pestilence I have suggested the connection between electricity and earthquakes, and violent tempests.—The following is a singular concurrence of facts to confirm the opinion.

On the 18th of October, 1769, four minutes before 12 o'clock at noon, a smart shock of an earthquake was felt at Kennebec, which lasted about a minute, and was instantly followed by a hurricane of wind; from N. W. by W. This wind continued all day. The next day, at the same minute of the day, another shock was experienced of still greater severity. Connect. Journal, Nov. 10, 1769.

It is a common remark, that thunder storms are less frequent and severe, within a few years past, than formerly. I think the remark well founded. The frequent and tremendous storms of that sort, from 1767 to 1773, are still fresh in my mind. One of them is worth notice, on account of the effects on the human body. On the second of September, 1771, a fearful storm of thunder, lightning, and rain happened at Fairfield, in Connecticut. It lasted two or three hours—the heavens were almost continually involved in a sheet of livid flame—the earth trembled with the thunder—and pewter was shaken from shelves. This storm left people with a dull, heavy pain and stupor in the head.

In connection with this fact, it may be remarked, that the cases of apoplexy and palsy, in 1771 and 1772, far exceeded what are usual. I have before me a list of cases that occurred

within a few months in this city and neighbourhood, equal to what is usual in the same number of years.

All the ordinary operations of the elements were upon a great scale. The inundation in Virginia, in May, 1771, swept away about five hundred buildings on James River only. The legislature granted thirty thousand pounds to the sufferers. Such occurrences are rare.

The memorable tempest of September 8, 1769, which levelled hundreds of houses, has probably not been equalled since, certainly not for many years past. Possibly, the great storm at Newfoundland, September 2, 1775, when the sea suddenly rose twenty or thirty feet, might have been equally fatal. In 1768 and 1769, Marblehead alone lost twenty-three sail of shipping, in violent gales, with one hundred and sixty seamen, besides many who were washed overboard from vessels that escaped destruction. By those losses seventy women were made widows, and one hundred and fifty-five children lost their fathers. Such periods fortunately are not common.

The diseases of that period were angina maligna, catarrh, and especially measles, which, probably, invaded the whole world. I have found the latter disease in the West-Indies, at the Cape of Good Hope, in Europe, and all parts of North-America.

The following case of yellow fever occurred in New-York, in 1771: Jacobus Roosevelt, on the remarkably hot Tuesday, August 6, drank too largely of cold water—was seized with pains in the stomach and bones—died the next day, and turned as "yellow as in a jaundice."

It is the common opinion, that mephitic air in wells and vaults is generated slowly, and is to be ascribed to a stagnation of the air in covered places. I have ventured, in the Appendix to my history, vol. ii. p. 334, to call in question this opinion, and suggest, that the deleterious gas is produced suddenly.

The following cases are in proof of that opinion. In July, 1770, a man in Boston entered a cistern to cleanse it, and instantly fell dead. The cistern had been entered a few days before without inconvenience.

In August, 1774, a boy went into a well, of about twelve feet deep, in Danbury, in this State, to get a vessel that had fallen in. He instantly fell motionless and died. This well *was open and used.* On examination it was found, that all the wells in the neighbourhood were filled with the noxious vapour. As these wells were open, and as the inhabitants ge-

nerally use a bucket to draw water, we have full evidence that the wells must have been filled suddenly, or in a short time, and nearly at the same time; for the action of the bucket speedily dissipates, and mixes the vapour with the air. I do not know whether the mortal dysentery at Danbury, the next summer, of which I have given an account in my history, under the year 1775, can be ascribed to the gas expelled at that time; but it deserves remark.

These facts, with those which I have related in the addenda to my history, seem to establish the point, that the carbonic acid gas, called damp, or mephitic vapour, is not generated slowly by a chemical process; and that stagnation in a covered well is not at all essential to its existence. The old theory then must yield to facts, and I wish you to turn your thoughts to the subject. I am more and more persuaded of the truth of my conjectures, that some internal force or demand *ab extra*, at times, expels from the earth some of the materials of our atmosphere; sometimes with a trembling of the earth, and sometimes without any sensible concussion; and that the noxious vapours, subsiding into low places, or combined with the aërial substances, evolved from animals and vegetables, constitute the invisible, but deadly agents of pestilential diseases.

The autumn of 1773 was so mild that green pease were gathered at Norwich, in Connecticut, about the first of November; and fresh ripe strawberries, a second growth, were gathered at Fairfield.

On the first and second of October, 1770, snow fell to the depth of six inches in Berkshire county, Massachusetts, and lay several days. The green leaves of trees were not affected. This was a rare instance of early snow. The following fact is equally singular. In autumn 1757, a deep snow and severe cold happened in October, the precise day I cannot learn. The frost was so severe, that the harbour in this place was closed with ice—an event that occurs only in our severest winter weather. This cold lasted four or five weeks, when the weather became temperate in December, and remained as mild as spring during the winter months.

I have often heard of fire balls during tempests, but the following fact is more remarkable. On the 12th of August, 1771, in a perfectly clear day, a blaze of fire entered a room at Cape-Elizabeth, in Maine, where a young woman was weaving, burnt one of her arms, and set fire to the harness and web in the loom. The cries of the woman brought relief, and the fire was happily extinguished. Electrical phe-

nomena were unusually numerous in that and the next year; but I leave philosophers to judge of the connection and the causes.

In our old histories we read of springs and rivers of blood, which the distempered imaginations of men converted into omens dire. A similar phenomenon happened about two years ago, at Salem or Fredericksburgh, but the account of it is mislaid. The following is before me. On the third of April, 1769, a small stream gushed from the earth at New Canaan (Columbia county), exhibiting the appearance of blood. The water in a vessel was of a deep carnation. This discharge was of an hour's continuance. The phenomenon was repeated for several mornings near the same place, and when dry, the earth had an offensive smell. My motive for relating this account is, to evince the impropriety of charging Livy, and other authors of credit, with relating fables.

But I have a more serious subject of discussion. In the review of my History of Pestilence it is expressed as a matter of regret, that I had espoused the exploded doctrine of equivocal generation. I confess the rejection of the doctrine, as I understand it, is a strong proof of the pride of modern philosophers, and their willingness to embrace any current theory of the day, without reason, and contrary to most obvious facts. Equivocal generation, in the true understanding of the phrase, denotes doubtful or uncertain origin. That modern discoveries have explained some things which were once uncertain, is undeniable; but the generation of many animals is yet as uncertain as it was in the days of Aristotle. Just as far as facts will authorise us to go, so far we tread on sure ground: —all beyond is hypothesis; and we have no right to adopt or reject general doctrines on hypothesis. Will any man venture to assert that the worms found in the human stomach are not animals? or that they are generated by a parent worm of the same species? or that a worm of twenty inches in length, found in a human liver, had a parent of the same kind, when, perhaps, a similar animal never before existed? In 1773, the patients in a very malignant dysentery in East-Haven, generated worms in such numbers as to be suffocated by them. Where or what was the parent animal, that, on that particular occasion, deposited its young, or the germs of innumerable animals, where none had appeared before? It is possible, in such a case, that each worm may have, for its origin, a germ of animal life in an undiscovered insect; yet the phenomena warrant us in determining that they could not proceed from a

parent of the same species, but from some unknown germ or principle; and this is precisely equivocal generation.

Again; let a particular plant be transported to a distant country, where nothing of the sort ever grew: on that plant will be found insects which were never before in that country. Let a single tobacco-seed be conveyed to an island a thousand leagues from any spot where tobacco has ever been propagated, and the plant from that seed will contain a worm never before existing on that island. Perhaps an egg may be deposited by an animal, and perhaps such a germ of animal life may be essential to the existence of that worm; but the worm shall be a new species in that island, and one that could not have existed there without that particular plant.

The generation of the eel is a point that has puzzled all the investigators of nature. Some philosophers have conjectured that they have discovered the marks of sex in that animal; but it yet remains doubtful. It is acknowledged on all hands, that let a pond of water be made in any suitable place, remote from other water, and it will, in a reasonable time, be furnished with eels. It is agreed that these animals could not travel thither by land, and, therefore, men resort to *hypothesis* to account for their origin, pretending that they must be transported by aquatic birds. *Encyclop. art. Muræna.*

A remarkable instance of this kind of solution of difficulties we have in the History of Carolina, vol. ii. p. 303. Lond. 1779. I will cite the whole passage. "In every plantation great care is taken in making dams to preserve water for overflowing the rice-fields in summer, without which they will yield no crops. In a few years after this pond is made, the planters find it stocked with a variety of fishes; but in what manner they breed, or whence they come, they cannot tell, and, therefore, leave that matter to philosophical inquirers. Some think that the spawn of fish is exhaled from the large lakes of fresh water on the continent, and, being brought in thunder-clouds, falls with the drops of rain into these reservoirs of water. Others imagine that it must have remained every where among the sand since the time the sea left these maritime parts of the continent. Others are of opinion that young fish are brought by water-fowls, which are very numerous, from one pond to another; but, be that as it will, the effect is visible and notorious all over the country." These are curious modes of propagating fish. The latter resembles the method of spreading epidemic diseases—the water-fowls being the fomes, which, after swallowing and digesting the

fish, fly away to a distance, and communicate the infection to an empty pond. I have heard of eels sliding through fowls undigested; but this is the first time that I ever heard of such flimsy suppositions to help out a theory of propagating other kinds of fish.

Indeed, Sir, I think it more becoming the limited knowledge of man to acknowledge his ignorance, than to be positive on such doubtful subjects. It is far from being impossible that the principles of animal and vegetable life may be radically the same—descending from man to the minutest germ of life in grades almost imperceptible in the larger species, and in the smaller species wholly beyond the reach of optics; and these elementary principles may originate life, in the form of vegetables or animals, according to the nidus. But hypothesis must not be the basis of system; and when the mode of generation is doubtful, I set it down as *equivocal*, which is only another term for human ignorance.

It is well known that vegetable substances have been found growing out of the flesh of living animals; not from seed most certainly, for the vegetables are of species unknown, and *sui generis*.

The minutest part of a polypus, detached from the animal, produces a new and perfect animal—not by any usual mode of generation: and the whole class of zoophytes confounds all philosophical reasoning on this subject.

As to the atheistical tendency of the doctrine, I am quite unconcerned on that score. There is a fashion in opinions as well as in dress: each system must have its day. Not many years ago Boerhaave was the *omnis homo* of the faculty. He soon yielded his place to Cullen: Brown triumphed over Cullen: and now Sydenham, who had been cast away as rubbish, has reassumed his station as the father of a system, with his occult qualities. Similar is the rotation of opinions in chemistry. Opinions even become national—and we see Lavoisier arranged against Priestley, as formerly Cassini against Newton.

With respect to the theological consequences of the doubtful generation of plants and animals, I have one remark to make—That the modern distinction between primary and secondary causes seems to be carried too far; and, if I mistake not, has been the means of supporting, if not of originating, the usual arguments in favour of materialism. That matter can be endowed with laws, which shall operate uniformly and perpetually, independent of divine agency, may be possi-

ble, but appears to me unphilosophical. I can have no belief in permanency of duration in any being but God, and the operations of his power. The opinion that natural effects proceed from laws impressed on matter, without any direct exertion of divine power—and that supernatural effects are produced by the immediate agency of the Supreme Being—appears to me at least unfounded, and even unscriptural. The scripture generally ascribes every event directly to the first cause. It was God who hardened Pharaoh's heart, and who caused it to rain, as well as God who created the world, and arrested the sun in his course. This view of the question is not only more pious, but more philosophical; for I no more comprehend the growth and expansion of the rose in my garden, than the creation of the earth, or the resurrection of Lazarus. The result of my philosophy is to resolve every event and operation in the universe into the direct exertion of omnipotence. And I cannot but think that the modern doctrine of nature and natural laws, which seems to exclude the divine agency from most of the operations in the universe, has furnished the most tenable ground occupied by the materialists. This opinion of mine involves in it the idea that God is the author of evil; but this, in my mind, is no objection to it; for what we call evil is such only to our limited views.

But I am proceeding beyond my depth: it is best to put an end to this desultory letter. I have little leisure for philosophical researches—being engaged in compiling a system of principles for the education of our youth, on a plan new and more comprehensive than has yet appeared. I have an insuperable dislike to metaphysical studies, believing in the utility of plain matter of fact only.

With much esteem,
Believe me your friend and obedient servant,

N. WEBSTER, jun.

ARTICLE VIII.

REMARKS *on the* WORK *entitled* "A Brief History of Epidemic and Pestilential Diseases:" *In a Letter from Dr.* PRIESTLEY *to Dr.* RUSH, *dated Northumberland, May* 4, 1801.

DEAR SIR,

I THINK myself under very great obligation to you for recommending to me, so strongly as you did, the reading of *Noah Webster's Treatise on Pestilential Disorders.* I think, with you, that it is, indeed, a most important publication. It has given much light on a subject in which I find I had been wholly in the dark before, and which is becoming every day more interesting.

I am now convinced of what I had no suspicion, and should have thought exceedingly improbable *a priori*—viz. that pestilential disorders of various kinds are principally owing to a state of the atmosphere vitiated by things which appeared to be too remote to have had any influence in the case, such as earthquakes, meteors, and comets; that the influenza, and other more common diseases, with the morbid affections of plants and animals, generally precede the more malignant disorders of yellow fever and the plague; that these two disorders, which I had thought to be fundamentally different, are only modifications of the same thing; that quarantine laws are of little use, for that these disorders will not spread except in the morbid state of the atmosphere of any place; and that, in such a morbid state of the atmosphere of sufficient continuance, nothing can prevent their appearance. These very extraordinary and important positions I cannot help thinking to be abundantly proved by the facts produced by Mr. Webster, and for this I think he deserves the thanks of all mankind.

I give you this trouble, to lay before you a more decisive proof of the noxious nature of vapours issuing from openings in the earth, than any that Mr. Webster has alleged. He argues, and very justly, that there is a connection between earthquakes and pestilential disorders, from the latter almost constantly following the former; but what that connection is, and in what manner the one contributes to produce the other, he has not shown, at least so distinctly as will appear from the

accoumt that I have lately met with of the formation of an island by a volcano in the bay of Santorin, in the Archipelago, written by a Jesuit who observed the phenomenon, and whose very particular description of it may be seen in the *Lettres Edifiantes et Curieuses*, vol. i. p. 78, of the Paris edition of 1780. The rising of this island is mentioned by Mr. Webster, but without the attendant circumstances.

The first appearance of this island was the 23d of May, 1707. During the volcano which produced it, he says, the sea of the gulph in which it was formed, from being of a bright green, assumed a red colour. Afterwards it was of a pale yellow, and it was accompanied with a great stench *(grande puanteur)*, which affected the isle Santorin, at the distance of several miles, in such a manner that the inhabitants were seized with acute pains in the head, and violent vomiting. He also observes that this vapour blackened silver and copper. (p. 87.)

This is not only a direct proof of a noxious vapour issuing from the earth, though covered by the sea, but that this vapour was of an acid nature, which favours Dr. Mitchill's proposal of alkaline remedies. Persons who went to examine this new formed island brought from it a congealed and heavy substance, which appeared to be a mixture of vitriol and a kind of refined bitumen; and when the volcano ceased, there flowed from the island a quantity of liquid matter, which was sometimes yellow, and sometimes red, but often green, extending four or five miles. (p. 105.) From this circumstance it may appear that this noxious acid vapour is some modification of the vitriolic, and not of a nitrous nature, as Dr. Mitchill supposes. Be it, however, any of the three mineral acids, it is rational to expect that it may be corrected by alkalies.

If seasons of pestilence may be expected after the appearance of meteors and earthquakes, there is some reason to apprehend the approach of another in these States: for in November of the last year an earthquake of a considerable extent was felt in Pennsylvania; and on the sixth of January, of this year, a very remarkable and very luminous meteor was seen at Northumberland, and many places at a great distance from it, so that it must have been at a great height in the atmosphere, as many others of the same nature have been.

Also, on the eighth of August last, I was called out of my house to observe a singular kind of lightning: indeed, it was more of the nature of a meteor than of lightning; for the

flashes were of some continuance, and many of them threw out a prodigious number of balls of fire. One of these *streams* of lightning, for they could not well be called *flashes*, very much resembled a rocket. It arose from below the horizon, and extended beyond the zenith; and there came from all the parts of it, in every direction, small balls of fire, which, by a common optical deception, seemed to be connected with their source by fine strings of fire. They went to some distance, and then vanished. It was a magnificent fire-work. Those flashes, some more and some less remarkable, but all differing from common lightning, continued a long time; and, I doubt not, were of the nature of meteors, and, therefore, may be expected to have the same consequences.

I would observe that the flashes of lightning which we have without thunder are, sometimes at least, in a region far higher than that of the ordinary atmosphere. When I lived at Leeds, in England, I remember to have been particularly struck with an appearance of this kind, which continued, almost without intermission, about two hours; and, collecting accounts of its apparent place and altitude, as seen from different situations, I computed that it was about twenty miles high, and nearly perpendicular on the promontory called *Flamborough Head*. But meteors, properly so called, have been observed a hundred miles high.

I cannot forbear expressing my surprise that a person who writes so judiciously as Mr. Webster does, with respect to the proper object of his work, should advance opinions so wild and unphilosophical as some that appear towards the close of it, and especially that he should be an advocate for what I thought to have been the long exploded doctrine of *equivocal generation*—believing that various animals, the structure of whose bodies is as exquisite as that of man, all bearing marks of infinite wisdom, should arise spontaneously from the natural elements of earth, air, water and fire, which are void of all intelligence.

Among such animals he enumerates, besides insects in general, and some of them of *unusual forms*, clouds of flies, black worms an inch and a half in length, which devoured grass and corn, generated, he says, suddenly, and covering two or three hundred miles of country, and the Hessian fly. He seems, too, to believe that the extraordinary number of frogs, toads, and even shad, which precede seasons of pestilence, have no other origin than that pestilential air producing

an uncommon degree of excitement, which he ascribes to electricity—and that they are again destroyed by a sudden change in the elements which produced them.

After saying that "new plants frequently spring up, generated by new powers in the elements, occasioned by different combinations of heat, moisture and air, without any previous seed—and that the elements of air, water and fire, are fitted to produce animals of kinds proper to subsist on them"—he expresses his wonder that "men should still be found to deny the doctrine of equivocal generation."

But if any one of these plants or animals, even the smallest, and to appearance the most insignificant, could be formed without intelligence, from unconscious elements—oaks, elms and cedars—horses, elephants and men, might have originally come into existence in the same way, and the whole universe have had no intelligent author. And yet Mr. Webster appears not only to be a believer in a supreme intelligent author of nature, but in revelation too. I am confounded when I reflect on such inconsistencies, and that they should be found in a work which, for a laborious collection of facts, the accurate statement of them, and just reasoning from them, is truly admirable.

Had Mr. Webster maintained that any being, of sufficient power and intelligence, had interposed on these occasions, and produced new plants and animals, or an extraordinary number of old ones, and removed them when they were no longer wanted, there would not have been any thing impossible, but only highly improbable, in the supposition—miracles being supposed to be wrought without any just occasion for them. But to ascribe the production of living beings, bearing marks of infinite skill, to elements without intelligence, and even without life, is not placing the world upon the elephant, or the elephant upon the tortoise, but upon nothing at all.

Not doubting your concurring with me in these sentiments,

I am, dear Sir,
Yours sincerely,

J. PRIESTLEY.

P. S. Having, in the preceding letter, given an account of a change of one of my opinions, and a cure of a prejudice of one kind, I am reminded of the removal of another during my late visit to Philadelphia. It was that which, in common with many Englishmen, I had against blood-letting. I

now believe that I owe my life to your judicious direction of it. I shall also never forget your so readily forgiving my suspicion, and my requesting the concurrence of Dr. Wistar after the third bleeding. But it was his opinion, as well as yours and Dr. Caldwell's, that my disorder required several more; and the completeness of my cure, and the speediness of my recovery, prove that you were right. In the future I shall never be afraid of the lancet when so judiciously directed.*

If you should think this letter of sufficient importance, I shall have no objection to your sending it to the *Medical Repository.*

* In order to render this matter more intelligible to readers at a distance, it may not be amiss to mention, that, in consequence of the great difference in modes of practice between Dr. Rush and several of the physicians of Philadelphia, which took place during the yellow fever in the year 1793, and afterwards in some other violent diseases, Dr. Rush objected to consulting with them. Since, however, a greater uniformity of opinion is said to have taken place among the physicians of that city in the use of the remedies in queſtion, Dr. Rush's objections have ceased; and we are informed, that, when required, he now consents to meet any of his brethren in a sick room. However painful and disagreeable the consequences of Dr. Rush's conduct have been to himself and others, it must be admitted that there may result at least equal mischief from phyſicians of opposite opinions and practice undertaking to consult with each other. Two opposite modes of treating a disease may be equally successful; but surely a mixture of the two modes (which generally takes place when physicians of opposite principles are induced to consult) must be always hurtful, and frequently fatal. EDIT.

ARTICLE IX.

An ACCOUNT *of a* CHILD *nearly poisoned by the* SEEDS *of the* THORN-APPLE: *Communicated in a Letter from Dr.* SAMUEL BROWN, *of Lexington (Kentucky), to Dr.* MITCHILL.

ON the 5th of April, 1801, I was called a few miles from Lexington, to visit a child of Mr. George Bryan, aged two years. The following history of her complaint was given me by her relations.—About ten o'clock of the same day she was observed to catch at the blaze of the fire in a very singular manner, and a few minutes after fell on the floor as if she had been paralysed on one side. In a short time symptoms of violent fever came on, with delirium, and

a scarlet efflorescence over the whole body, which had not entirely disappeared when I saw her first, at 12 o'clock P. M. This efflorescence was much more bright and lively than that which characterises scarlatina. Through the day the delirium continued with short intervals of reason. An unceasing disposition for motion in all the muscles, weeping, screaming, laughter, and rapid incoherent exclamation, formed the leading features of this disease, which to me was both new and alarming. Once or twice the child had made feeble efforts to vomit, which induced the family to believe that worms were the cause of these extraordinary symptoms. My hesitation and doubt with regard to the truth of this opinion, I perceived, gave the parents of the child considerable uneasiness. But as I was impressed, from the beginning, with a firm conviction that there was something in the case which I had not before seen in my practice, I thought it proper to act with much caution. On presenting a candle to the child, I discovered an unusual dilatation of the pupils, and a remarkable squinting of the right eye, which, however, was not constant. The pulse was extremely irregular; sometimes it was hurried and fluttering, sometimes it was tense and strong, and frequently its action was not discernible. The motions of the limbs and body resembled those which mark the highest grade of *chorea sancti viti*, but were much more convulsive and violent, and excited in the spectators rather a *painful* than a *ridiculous* emotion. Contemplating the case with great solicitude, it occurred to me that these strange symptoms might originate from the effects of the datura stramonium on the stomach, and I immediately inquired if that plant grew near the place, but was answered in the negative. On repeating my inquiries, however, one of the children informed me that she had given some seeds to another sister who was not indisposed, but firmly asserted that none had been taken by the one who was ill. This discovery, although not completely satisfactory, rendered my first conjecture still more probable, and I determined to act agreeably to it. I therefore administered a strong dose of emetic tartar. It was long before I could produce nausea; and as the first efforts to vomit were abortive, I made use of a feather, which excited one feeble motion. No seeds were discharged; and I found great difficulty, even by the feather, in awakening the powers of the stomach. I had lately read some remarks of M. Humboldt on the possibility of renovating the excitability by alkalies, after exhaustion by opium. It occurred to me that I might

accomplish the same object when the excitability was wasted by any other stimulus. I therefore gave eighteen drops of ol. tartar, *per deliquium*, in a tea-spoonful of warm water. This had not reached the stomach two minutes when full vomiting took place, and seven seeds of the stramonium were thrown into a plate which Mr. Bryan held, that he might have an opportunity of proving the event of my prognostic. Considerable quantities of what we supposed to be chewed seeds were thrown up. I still continued the administration of the tartar emetic, and the ol. tart. *per deliquium*, which, I think, always had the effect above ascribed to it. At length the bowels were moved, when I thought it prudent to give a little warm toddy, and leave the child to rest. In the morning I found, that notwithstanding she had slept well, some slight convulsive symptoms, together with wildness of countenance and dilatation of the pupils, remained. I ordered a few doses of rhubarb and pot-ash, which, in a day or two, removed every complaint.

The consideration of this case has suggested the following observations:

1. From the abundance of this plant around almost every dwelling in Kentucky, and from the sweetish taste of the seeds, it is very probable that children are frequently poisoned by it, whose cases have been mistaken for common convulsions, and thought to proceed from worms.

2. The common practice of many physicians, of resorting, in all spasmodic cases, to laudanum, or to calomel and opium combined, where worms are suspected, would, in all probability, have proved fatal in this instance, by contributing to the detention of the seeds, which the stomach had not dissolved after many hours.

3. Would not the topical application of the stramonium, by its power of dilating the pupil, facilitate the extraction of the cataract?

4. One of the most fruitful fields of physiological discovery is but little cultivated. A dose of opium, after a dose of pot-ash, ought, according to the experiments of Humboldt, to produce an effect very different from that which would result from an equal dose of opium taken after alcohol. From an attentive observation of the effect of *precedent* stimuli on the powers of those which are *subsequently* applied, it is probable that physicians may acquire from *old* drugs *new* means of combating dangerous and obstinate diseases. If the operation of a stimulus given this moment is *modified* by the opera-

tion of that administered immediately before it, we have great reason to suspect the truth of many of the Brunonian doctrines. This idea suggests the use of what might be called *predisposing remedies*, in order to obtain the full benefit of *efficient* ones, analogous to the *predisposing causes* which give to noxious substances the power of generating malignant distempers.

ARTICLE X.

EFFICACY *of* FERN *in causing the* DISCHARGE *of the* TAPE-WORM: *Communicated by Dr.* GARDINER JONES, *of the City of New-York.*

TO THE EDITORS OF THE MEDICAL REPOSITORY.

IT having been suggested by a friend that the following case might contribute, in some small degree, to the purpose of the Medical Repository, if it appear to the learned conductors of that valuable publication to merit a place, it is willingly submitted for insertion, by their friend and humble servant,

G. JONES.

ON the 6th of March, 1798, application was made to me in behalf of a young lady who was said to have a complaint of the stomach and breast. It had then been of some months standing. From the ordinary symptoms which presented, I suspected the disease to arise from worms, and advised, at different periods, several kinds of anthelmintics. The effect, at length, was an evacuation of some hundred joints of the tænia, or tape-worm: but notwithstanding almost incredible discharges of single joints and large convolutions of the worm, yet the patient received only temporary relief. Her pain of the breast, and extreme nausea, at intervals returned. Already had been administered repeated doses of calomel, cowhage, Carolina pink-root, santonicum, digitalis, preparations of steel, tin, and other things which I do not now recollect. Cathartics were occasionally superadded. But frequent discharges of numerous joints and large fragments of worm produced only a palliation of symptoms. Various kinds of bitter and saline medicines, succeeded by oleaginous and bitter injections, were given to no greater advantage. Still the pain of the breast and distressing nausea would frequently recur. Of

these symptoms carminatives and infusion of the bark produced only temporary relief.

It was on the 8th of July, 1800, more than two years from the date of the disease, when the strength and spirits of the patient were almost exhausted, that I procured from the country a quantity of fern, and directed a decoction to be made of the leaves. Of this she drank a pint a day, till some gallons had been taken, when a dose of castor-oil brought away the remnant of the worm, which consisted of four hundred and eighty-six joints, and measured in all forty-five feet.—The patient was immediately relieved, and continues since perfectly free from the disease.

ARTICLE XI.

CASE *of supposed* EXTRA-UTERINE FŒTUS: *Communicated in a Letter from Dr.* S. BARNUM, *of the City of New-York, to Dr.* MILLER.

New-York, April 11, 1801.

DEAR SIR,

HAVING had under my care an extraordinary instance of pregnancy, permit me to present you with a general history of the case.

About the first of June, 1800, Mrs. —— became pregnant with her first child. The symptoms of this state were such, at the commencement, as usually take place, and nothing uncommon occurred till the fourth month, when it was observed that she was larger than was usual at that period. She continued to increase in size very rapidly till the fifth month, when, from her appearance, one would have imagined that she had reached her eighth month. About the end of the fifth month, from imprudence, she was seized with violent pains resembling those of parturition, which soon brought on a profuse discharge of water, mixed with blood, from the uterus, and which, it was supposed, would soon terminate in miscarriage.

In this situation she was visited by a physician, who ordered her to be bled; after which the pains became less violent, and the appearance of blood was diminished for three or four days: there was then an increase of it for a week or more, when it almost entirely ceased, and the patient was so much relieved as to be able to walk about her room.

About the 20th of November, from exposure to cold and wet weather, she was again taken ill. The physician who had before attended her not being to be found, I was called in. I found her in great pain; and conceiving it proper to ascertain whether her labour had made any progress, an examination was made for this purpose. By this examination I discovered that the uterus was in a state approaching to that of retroversion; the os tincæ directed over the pubes, and the fundus towards the spine. I communicated this to the first attending physician, and likewise to another medical gentleman who was called in; who, from their own examination, agreed with me as to the position of the uterus.

The contraction of the uterus during the pains produced no change in its situation. Attempts were made with the hand to restore it to its natural situation, but all in vain. Anodynes and fomentations were then employed; notwithstanding which the pains continued to recur every fifteen or twenty minutes, for three or four hours, and then abated.

Before the first attack of pain the patient felt her child very lively; but after that its motions were scarcely perceptible. For a week previous to this period she had not felt it at all.

At this time her breasts became full of milk, and continued so for three or four weeks, when the secretion was suspended —what had been formed was absorbed—and the breasts became soft and flaccid. She observed to me that her child seemed to be on the right side, and that she could not lie on the left without giving herself pain.

The swelling of the abdomen began to subside after the discharge of the fluid from the uterus, and in the course of six weeks the size of it was not more than half of what it was at the fifth month; and during this subsidence of the abdomen the patient frequently complained of more or less pain. The continuance of pain exhausted her strength, and, at length, a troublesome diarrhœa came on, which, however, in a little time, was restrained by the use of columbo root in infusion: notwithstanding, she continued in a very debilitated state, and after the lapse of a few weeks the diarrhœa returned, and the stools were extremely offensive. She now complained of frequent chills, had regular accessions of fever every afternoon, cough, and œdematous swelling of the feet and legs. The abdomen was reduced nearly to its natural size, except a hard circumscribed tumour on the right side, immediately above the brim of the pelvis. This tumour seemed to be covered with nothing but the thin parietes of the abdomen, which rendered

it very distinct; and, when pressed upon by the fingers, a crepitous sensation was felt, similar to that arising from the diffusion of air in the cellular substance.

On the 8th of February, 1801, the diarrhœa was increased; the stools became more fœtid, and the pain attending them considerable. After an evacuation this day, she observed to the nurse that something hard had passed her; and, upon examination, it was found to be a fœtal os femoris, with some of the muscles adhering to it, in a decayed state. Immediately after this some of the fleshy parts of the fœtus came away, and soon after other bones of the extremities, entirely deprived of their muscles and ligaments. From this time bones were almost daily coming away with her stools, until almost the whole of the fœtal skeleton was discharged; when it being no longer in our power to support her strength, she died on the 12th of March.

Whilst the bones were coming away in the manner mentioned, particular attention was given to ascertain whether there was any discharge from the vagina, but not the least of any kind could be observed.

Unfortunately for the clear investigation of this case, permission to examine the body after death could not be obtained. An opinion, therefore, relative to its real nature, must rest entirely on conjecture; and when the symptoms and events of the case are considered, the most rational conjecture, in my apprehension, is, that it was one of the extra-uterine kind. But was it originally extra-uterine; or did it become so accidentally, from a rupture of the uterus during the violent pains which the patient suffered, and its being in a distorted position? If originally extra-uterine, how shall we account for the discharge of water from the uterus which took place in the fifth month, and which continued some time after? And if accidentally extra-uterine, from a rupture of the uterus, is it not probable that the violence done to this organ would have proved fatal much sooner than actually happened? Difficulties present themselves in whatever way we view the case. I shall, therefore, submit the facts, and leave it to others to draw their own conclusions.

I am yours with respect,

S. BARNUM.

ARTICLE XII.

Case *of* Poison *by* Arsenic: *Communicated by Dr.* S. Barnum *to Dr.* Miller.

New-York, April 11, 1801.

Dear Sir,

On the evening of the 16th of February, 1801, I had presented to me, by a young gentleman, a cup containing the remainder of a draught which a person had been just taking. Upon examination I found it to be white arsenic. I immediately repaired to the house where this person was, and, on coming into her room, I found her constantly reaching to vomit, and sometimes vomiting, with violent spasms of the stomach and bowels, with a weak and quick pulse, affected frequently with a diarrhœa of a dark bloody colour, and often complaining of coldness of her extremities. I immediately made inquiry how long it had been since she had taken the arsenic, and the quantity. From the best information that I could get, it was about an hour, and she had dissolved two ounces in a large tea-cupful of water. There was remaining in the tea-cup a table-spoonful or more of the arsenic, being partly in a dissolved state; the remainder, she said, she had taken. I concluded, from the time that she had taken it, that there might be some arsenic still remaining in the stomach that had not had its full effect, notwithstanding she had vomited considerably before I saw her. I accordingly gave her ten grains of the sulphate of zinc, which soon had its effect. I then gave her a weak solution of the carbonate of pot-ash, about a scruple to a pint of warm water. She retained the first I gave her but a short time on the stomach, but by the continuance of the solution she soon retained it better. She took, within three quarters of an hour, three pints of this solution, which checked her diarrhœa, and the pains of her stomach and bowels became quite easy. I then directed her sweet oil and milk, with the proportion of two-thirds of milk to one of oil, and a wine-glassful of this to be taken every half hour.

Finding her now much better, I ventured to leave her. I called the next morning, and found her walking about her room. I asked her how she did: she said she was free from pain, but felt very weak, and complained of soreness of her

stomach. I advised her to be very cautious what food she took into her stomach—to take no meat, but a very light diet, and in small quantities—such as barley-water, thin gruel, or thin chicken broth. By continuing this method for a few days she was restored to health.

From yours, with respect,

S. BARNUM.

ARTICLE XIII.

REMARKABLE CASE *of the* SUCCESSFUL APPLICATION *of* ELECTRICITY: *In a Letter from* JOHN VINALL, *Esq. to Dr.* S. BROWN, *of Boston. Communicated to Dr.* MITCHILL.

Boston, December 3, 1800.

DEAR SIR,

AGREEABLY to your request, I shall now give you a particular relation of a remarkable cure performed by electricity.

In July, 1790, I visited a young woman about twenty years of age, at the request of her physician, who was of opinion that electricity remained the only application untried, as her disease had baffled all other remedies.—Her case was as follows:

Some time in May, 1790, she was suddenly seized with extraordinary pains in her head, back and limbs. Medicines were administered by an able and judicious physician, but without effect; and her disease increased so rapidly as entirely to deprive her of sight and speech. Her hearing was likewise so much impaired, that it was with great difficulty she was made to hear the human voice. Her tongue was so greatly affected as to be useless to her. She had almost an entire locked jaw; for only a small part of a table-spoon could be introduced between her teeth, to convey the liquid she took into her stomach. Add to these dangerous symptoms, her right arm was without sensibility, and almost the whole of her right side. She had likewise a distressing constriction in her throat and chest, which greatly impeded respiration. She could take no nourishment except small quantities of liquids. She had continual fainting fits, and often appeared as if she would never revive. She had, for several months previous to her illness, a total suppression of the catamenia.

In this situation I found her, and was in great doubt whether an electrical application would answer any good purpose: but, at the earnest solicitation of her mother, I made the experiment—

First, by passing two light shocks through her paralytic arm; then two of the same strength through her lungs, from her right hand to her left. Immediately after the second shock through her lungs, she made signs to her mother that the distress in her throat and chest was relieved. This encouraged me to proceed. I then gave her an universal shock through the spinal marrow, of double the strength of the former shocks. After this I was preparing to apply the electric fluid to her right arm; her sight, I found, was so far restored by the foregoing applications, that she perceived my intention by the director which I brought towards her arm; she spake articulately, for the first time for a month before, and begged that I would not proceed. Accordingly I desisted at that time.

Her speech continued, attended with a considerable degree of stammering. The next day I visited her again, and, after going through an electrical operation as before, only with some little variation, her speech was entirely restored.

I attended the young woman for six or seven days, varying the force of the shocks according to her strength. Found a further attendance unnecessary, as her sight was as good as before her illness; her hearing perfect. The paralytic parts of her body recovered their tone, and all the functions of the body were in a natural state, though she was weak and debilitated. In a few months after she recovered her health perfectly, and was afterwards married, and had several children.

I am, dear Sir,

Your friend and humble servant,

JOHN VINALL.

ARTICLE XIV.

CASE *of* IMPERFORATED ANUS: *Communicated by Dr.* JOHN P. CAMPBELL, *to Dr.* SAMUEL BROWN, *of Lexington, Kentucky.*

NOVEMBER 23, 1800, I was called to visit the child of Mr. Hutson, in the vicinity of this place, on the second day after the birth. The case was an imperforate anus. As

an operation was inevitable, the next day was determined upon for that purpose. On the third day, when I went to operate, the child was very fretful and uneasy—the abdomen was much distended and discoloured—and, from the information of the nurse, the fæces had been frequently vomited up through the day. I began the operation by making a longitudinal incision on the place where the anus should have been, which was slightly marked by nature. This incision I extended in the direction of the os sacrum, with a lancet, until that instrument could be no longer serviceable; and no fæces following it when withdrawn, I introduced the scalpel, and carried it up in the same direction until I had the pleasing sensation of having reached a cavity. The instrument was withdrawn, and the meconium flowed plentifully. The child was placed in a warm bath up to the middle, for a few minutes; and after this a tallow bougie being introduced to keep the orifice open, the little sufferer dropped into a pleasant sleep. The bougie and warm bath were continued but a few days, with the occasional use of some magnesia alba and rhubarb, till the child recovered, and every expectation to be derived from the operation was fully answered. At this time the child does well, and the mother assures me she observes nothing in its present condition different from that of others which she has already nursed. My only fear was that the sphincter muscle might be destroyed; but I am now convinced no inconvenience will ever result from that quarter.

JOHN P. CAMPBELL.

Flemingsburg, March 9, 1801.

N. B. It was a female child; and the length of the canula, which I ascertained by measuring the instrument, appeared to be about three inches.

REVIEW.

ART. I. *Some Account of the poisonous and injurious Honey of North-America. By* Benjamin Smith Barton, *M. D.* 4to. pp. 20.

HAVING waited some time since this essay came into our hands for its publication in the fifth volume of the Transactions of the American Philosophical Society, we have concluded to anticipate its appearance in that work, by giving some account of it here: and we do this the more readily, as we observe it was read before that respectable body as long ago as July, 1794, and because we are of opinion its contents ought to be made known without longer delay.

Honey, being a vegetable secretion, generally possesses somewhat of the flavour and other qualities of the plant which affords it. This nectareous juice, which is mostly, in cultivated countries, so agreeable to the taste, and so friendly to the constitution of man, is not *always* distinguished by those palatable and nutritive properties. It sometimes operates as a cathartic, when freely eaten; and in some persons of unusual idiosyncracies it has been known to excite great uneasiness, and violent griping pains. But these are not the noxious consequences resulting from the reception of honey into the stomach, treated of in this memoir.

In South-Carolina, Georgia, and East-Florida, it seems, more accidents have happened from eating poisonous honey than in any other parts of North-America. This liquid is generally collected by the *wild* bees—the descendants of the swarms of the *apis domestica* first carried there by the Spaniards. A presumption naturally arose, that in the flowery ranges and savannas, where the wild honey of this region was prepared and collected, there must be more wild plants, imparting to it injurious qualities, than grow on arable land, or in places less favourable to the vegetative functions of those species. Upon investigating the subject, this is found to be the fact. The plants affording poisonous nectareous secretion are, 1. The *kalmia angustifolia*, or dwarf-laurel, concerning which Dr. Barton relates the following occurrence:

"About twenty years since, a party of young men, solicited by the prospect of gain, moved, with a few hives of

bees, from Pennsylvania into the Jersies. They were induced to believe that the savannas of this latter country were very favourable to the increase of their bees, and, consequently, to the making of honey. They accordingly placed their hives in the midst of these savannas, which were finely painted with the flowers of the *kalmia angustifolia*. The bees increased prodigiously, and it was evident that the principal part of the honey which they made was obtained from the flowers of the plant which I have just mentioned. I cannot learn that there was any thing uncommon in the appearance of the honey; but all the adventurers who ate of it became intoxicated to a great degree. From this experiment they were sensible that it would not be prudent to sell their honey; but, unwilling to lose all their labour, they made the honey into the drink well known by the name of metheglin, supposing that the intoxicating quality which had resided in the honey would be lost in the metheglin. In this respect, however, they were mistaken. The drink also intoxicated them, after which they removed their hives."

2. *Kalmia latifolia*, or great laurel, one of the most beautiful flowering shrubs of the American woods, growing plentifully in the middle and northern States. 3. *Kalmia hirsuta*, a pretty little shrub growing in the southern States. 4. *Andromeda mariana*, or broad-leaved moorwort. As these are very plentiful in many of the American forests, their blossoms afford much honey for the wild bees.

Dr. B. further thinks it will be found that other plants yield unwholesome honey—such as, 1. *Rhododendron maximum*, or Pennsylvania mountain laurel. 2. *Azalea nudiflora*, or wild honeysuckle. 3. *Datura stramonium*, or stinkweed. But on these further observations ought to be made.

The learned author next quotes from the ancients the information left concerning poisonous honey by Dioscorides, Pliny, Xenophon, and Diodorus Siculus; and, by the assistance of Tournefort and his own excellent botanical judgment, endeavours to ascertain from what plants it was collected. He then shows, by references to the Georgics of Virgil, that there is classical authority to show that the Romans had an idea of the hurtful qualities of several plants to bees.

The symptoms produced by eating deleterious honey are thus described:

"The honey which I call deleterious or poisonous honey, produces, as far as I have learned, the following symptoms or

effects: viz. in the beginning, a dimness of sight, or vertigo, succeeded by a delirium,* which is sometimes mild and pleasant, and sometimes ferocious; ebriety, pain in the stomach and intestines, convulsions, profuse perspiration, foaming at the mouth, vomiting and purging; and, in a few instances, death. In some persons a vomiting is the first effect of the poison. When this is the case, it is probable that the persons suffer much less from the honey than when no vomiting is induced. Sometimes the honey has been observed to produce a temporary palsy of the limbs; an effect which I have remarked in animals that have eaten of one of those very vegetables† from whose flowers the bees obtain a pernicious honey."

"Death is very seldom the consequence of the eating of this kind of honey.‡ The violent impression which it makes upon the stomach and intestines often induces an early vomiting or purging, which are both favourable to the speedy recovery of the sufferer. The fever which it excites is frequently relieved, in a short time, by the profuse perspiration, and, perhaps, by the foaming at the mouth. I may add, that as the human constitution resists, to an astonishing degree, the effects of the narcotic and other poisonous vegetables that are best known to us, so we need not wonder that it also resists the effects of the deleterious honey which is procured from such vegetables."

"It deserves to be mentioned, that the honey which is formed by two different hives of bees in the same tree, or at a little distance from each other, often possesses the most opposite properties. Nay, the honey from the same individual comb is sometimes not less different in taste, in colour, and in its effects. Thus one stratum or portion of it may be eaten without the least inconvenience, whilst that which is immediately adjacent to it shall occasion the several effects which I have just enumerated."

The noxious plants of our farms, gardens, fields and forests, are all of them worthy of being known, as well they that are

* "An intelligent friend of mine related to me the case of a person who, for a short time, was severely affected from the eating of wild honey, in Virginia. He imagined that a person seized him rudely by one arm, and then by the other. After this he fell into convulsions, from which, however, he recovered in about an hour. It was imagined that this honey was obtained from a kind of poisonous mushroom."

† "The kalmia latifolia."

‡ "We shall afterwards see that not one of Xenophon's men died from the deleterious honey which they had eaten, in large quantities, on the shores of the Euxine Sea."

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directly and disgustingly venomous, as those which poison under the disguise of sweetness and innocence. The practical inferences to be derived from Dr. B.'s inquiries on this subject are, that the four first-mentioned plants, *known to furnish* unwholesome honey, should be extirpated in the neighbourhood of apiaries; that the honey procured from the three enumerated in the second place *as suspicious*, should be carefully examined to settle the fact with regard to them; and that observations be made on other plants—such, for example, as tobacco, poppies and buckwheat, with the view of ascertaining the precise qualities which the nectareous secretion of these respectively possesses. By becoming thus acquainted with the plants affording injurious honey, and being taught to avoid them, we shall have taken an important step towards the further knowledge of those from which good and well-flavoured honey is procured. We should be glad to see a list of such indigenous vegetables, arranged in the order of their excellence, from clover, or whatever other plant affords the most excellent honey, to that which furnishes the poorest, short of actual noxiousness. And, from a hint dropped by the author, we are led to hope he will one day give such a catalogue.

"Tantus amor florum, et generandi gloria mellis."

ART. II. *Observations on the Arguments of Professor* Rush, *in favour of the inflammatory Nature of the Disease produced by the Bite of a mad Dog. By* James Mease, *M. D.* 8vo. pp. 62. *Philadelphia.* Young. 1801.

WE know of no disease which ranks higher among those which are considered as opprobrious to medicine than Hydrophobia, produced by the bite of a rabid animal. It would be rash to assert that it has never been successfully treated; but there seems to be good ground to believe, that none of the remedies hitherto employed can lay claim to probable efficacy, and that it is perfectly warrantable, in the present state of knowledge, rather to follow the lights of analogy and conjecture in pursuit of new remedies, than to persist in the use of such as are proved to be incompetent and fruitless. In addition to the respect which the intrinsic merits of this pamphlet inspire, we applaud the author for the constancy and spirit he exhibits in still advancing on the *forlorn hope* of this medical contest with hydrophobia. The laurel of victory and

the gratitude of mankind will be well bestowed upon him who shall enable us to triumph over this direful distemper.

Dr. Mease, some years ago, adopted the opinion, then taught by Professor Rush, that hydrophobia, like tetanus, was a disease of relaxation and debility, and to be treated with tonic and stimulant remedies. In the further prosecution of his inquiries, the Professor abandoned that opinion, and now believes the disease in question, like malignant fevers, to result from excess of action, and to demand a bold use of depleting remedies. The reasoning which effected this change of opinion in Professor Rush, produced no conviction on the mind of our author; and the object of the present publication is to vindicate his adherence to his former principles.

In the course of the discussion, Dr. M. follows Professor Rush through a long train of argument, sometimes questioning the authenticity of his facts, and sometimes combating the inferences drawn from them. In opposition to the doctrine which the Professor had endeavoured to establish, that the disease of all rabid animals is of the nature of a malignant fever, Dr. M. insists that, in many important particulars, the analogy contended for is not sufficiently close and constant; and that, although some circumstances of rabies resemble malignant fever, there are other leading ones in which no such affinity can be traced.

Professor Rush had also maintained that the disease in the human species, produced by the bite of a rabid animal, is a malignant fever. This he supposed to be proved by the similarity of the symptoms; by the accession of the disease at various intervals after the reception of the infection into the body; by similar appearances of the blood drawn from persons labouring under the two diseases; by the agreement between them in point of duration; by the equally rapid putrefaction of bodies dead of both diseases; and by the discovery of like appearances in such bodies, when examined by dissection.

In reply to this doctrine of analogy between hydrophobia and malignant fever, as manifested by the circumstances of the two diseases in the human system which have just been mentioned, Dr. M. contends, that if the similarity of symptoms, to a certain extent, be admitted, there still exists a dissimilarity of symptoms in many important particulars, which brings the disease in question to a nearer resemblance of what are called *nervous* than *febrile* affections; that, as to the interval between the application of the remote cause and the attack of the disease, Professor Rush's analogy must be acknowledged to fail,

as hydrophobia from canine virus, unlike malignant fevers, has been known to come on at all intermediate periods between ten days and nineteen months after the infliction of the bite; that appearances of blood drawn in diseases are too variable and fallacious to afford any dependence, and that, even if they deserved any degree of reliance, there is still a deficiency in the proof of the appearances insisted upon by Professor Rush; that mere sameness of duration, if admitted in the fullest degree, is too loose an analogy to allow any inference of moment to be drawn from it; that the rapid putrefaction of bodies dead of hydrophobia, though by no means an universal occurrence, is yet so common in cases of sudden death without loss of much blood, as to justify no such conclusion as that which Professor Rush attempts to draw; and that, as to the similarity of the phenomena exhibited by dissections, which are admitted in some degree, but which Dr. M. supposes to be stated in too strong and unqualified terms, they may be accounted for on the principle of the irregular distribution of blood and of nervous influence, which remarkably takes place in this disease, and in some other analogous nervous affections.

Notwithstanding these plausible objections to Professor Rush's doctrine of analogy between hydrophobia and malignant fevers, we are persuaded that a view of the whole phenomena will go far to confirm such an analogy. We are also convinced that the appearances of bodies dead of these diseases, as laid open by dissection, do often warrant the same conclusion. Two instances of hydrophobia from canine virus, which lately occurred in this city, are cases in point. Besides the general similarity of their aspect to malignant fevers, in one of them black-vomiting, exquisitely characterized, was frequent during many of the last hours of life, and the stomach, on dissection, was found to be deranged in the manner commonly described after malignant fevers; and in the other, an unusual yellowness of the skin, with livid spots interspersed, was observed after death. In the latter case a dissection did not take place.

Dr. M. proceeds, in the next place, to examine the validity of Professor Rush's proofs of his theory, derived from the cure of the disease by blood-letting. After a careful examination of the cases, as described by the reporters of them, he suspects that many of them were in reality other diseases, mistaken by the observers for hydrophobia from the canine virus; and that, as to the rest, the use of many other remedies

at the same time makes it doubtful how far the cure was to be ascribed to blood-letting. It is difficult, and perhaps impossible, in the present state of our knowledge of this disease, to determine how far blood-letting may be directly useful or pernicious, and how far it should be employed as auxiliary or rejected as detrimental to other remedies. That it has been used to a great extent, in a multitude of cases, without any apparent advantage, is abundantly evident. And, upon the whole, we are disposed to believe, from many phenomena of the disease, as well as from its general want of success, that this remedy, used alone or in combination with others, in any manner hitherto distinctly known, may be properly placed on the long list of those which experience has adjudged to be ineffectual in the treatment of hydrophobia. How far its powers may hereafter be efficaciously applied as preparatory or relative to other remedies, we presume not at present to decide.

The method of cure which Dr. M. is disposed to recommend follows next in order. In his former essay on this disease he had recommended the use of opium in very large doses; but, from some examples of its inefficacy in the largest doses, he now thinks it unavailing to trust in that remedy. "In its place (says he) I would recommend the use of the powdered leaves of stramonium,* or their extract, in doses of two grains for an adult. By that quantity Dr. Cooper† found the pulse 'increased in frequency at first, and that it afterwards became full and quick, and produced giddiness, *warm skin*, moist hands, and *sleepiness*.' A defect of due energy in the heart, wakefulness, and cold skin, are symptoms that constantly attend the disease, and the two last are the sources of much distress. Hitherto no remedy has had the least effect in removing them. Their cure will greatly assist toward the removal of the whole complaint. This may be effected, in my opinion, by the *stramonium*, if given *early* in the disease. It should be exhibited in such doses as will *powerfully affect the system*, and repeated as often as a previous dose has ceased to act. During the suspension of the symptoms, bark and wine ought to be given, and the dose gradually increased, so as to keep up a regular excitement, and produce a permanent vigour in the system. The quantity of wine may be unlimited. Indeed, the only rule that ought to be observed with respect to it is,

* Thorn-apple, or Jamestown-weed.
† Inaug. Dissert. 1797.

to *give it in as large quantities as the stomach will bear, and until it produces the desired effect.*

" In case, however, the above remedies cannot be obtained or exhibited, I should have no hesitation in trying another plan, which has several arguments to authorise the experiment, although, at first view, it may appear to be attended with danger. It is, *to excite a strangury by means of cantharides.*

" The principle of the animal economy, first unfolded by J. Hunter, of one irritation curing another, is daily and amply confirmed in practice, and its application in the present disease seems highly probable. Without referring to the many instances afforded, in illustration, I may adduce one disease which is nearly allied to the present, viz. tetanus. When this is occasioned by the lesion of a nerve from a rusty nail, or other pointed instrument, we find it readily yields to an irritation of the wounded part, raised by scarification, and the application of hot turpentine, marine salt, or cantharides; and in the progress of the disease, or when it succeeds the exposure of the body to dews and night air, after being heated in summer, an irritation of the salivary glands by mercury as readily proves effectual. A knowledge of these facts, and a conviction of the truth of the principle would have been sufficient to prevent my hesitating to try the plan I propose; but I am now confirmed in my opinion of its utility and perfect safety, in consequence of the cure, by its use, of a desperate case of tetanus, by Dr. S. Brown, of Lexington, Kentucky, who lately communicated the history to Dr. Rush. The patient, a lady, was nearly exhausted by the disease, when her judicious physician gave her the tincture of cantharides, which, by exciting a temporary inflammation in the stomach and bowels, and producing a strangury, effected a cure. The most dangerous pleurisies have also been cured by the late Dr. Lieper, of Maryland, after the common remedies had failed, by exciting a strangury by means of the same tincture mixed with camphorated spirits of wine;* and, when combined with tincture of Peruv. bark, and given with the same view, it has been recommended by experience in the hooping-cough."†

" The recommendation of the remedy in this disease produced by the bite of a mad dog is not new. Morgagni mentions its general use for the cure of the disease in Germany; his remark is confirmed by a late author.‡ A Silesian peasant

* " Rush's Works, vol. iv. p. 35.

† " Lettsom's Mem. Lond. Dispensary.

‡ " Diss. de Hyd. Auct. G. Uiberlacher, of Vienna.

also acquired much reputation for the cure of the disease, and on the purchase of his secret by the King of Prussia, in 1777, the basis was discovered to be the *meloë proscarabæus et majalis** (oil beetle). All the insects of the meloë tribe possess a blistering quality. In a disease which has hitherto so generally proved superior to all the efforts of medicine, it is a duty to try every plan which promises the least success. The one I now urge is supported by a just theory, a close analogy, and, if we admit the German authority, I may add, is proved by experience."

It must be matter of regret to every inquirer on this subject to find so little hitherto satisfactorily known. The author of these Observations, after all his ingenious and diligent investigation of the disease, is compelled, like those who had gone before him, to found the treatment of it chiefly upon conjecture and analogy. We would still, however, recommend the subject to his further examination—hoping that he may yet, before long, be able to recall the public attention to it, under the direction of new views and happier auspices.

ART. III. *Introduction to a Course of Lectures on Natural History, delivered in the University of Pennsylvania, November* 16, 1799. *By* Charles W. Peale. 8vo. pp. 28. *Philadelphia.* Bayleys. 1800.

ART. IV. *Discourse introductory to a Course of Lectures on the Science of Nature, &c. delivered in the Hall of the University of Pennsylvania, November* 8, 1800. *By* Charles W. Peale. 8vo. pp. 50. *Philadelphia.* Poulson. 1800.

NATURAL History is a branch of science for the learning of which provision has been made in the University of Pennsylvania, and few of our readers need be informed that the business of imparting public instruction on the subject has been intrusted to Professor Barton. The frequent and respectful mention of him in the course of our work, and the accounts therein contained of his labours and publications, must be fresh in their recollection. And although he has done so much to enlarge the Natural History of America, they have good reason to expect more; for industry and talents like his will ever be engaged in something laudable.

* "See C. T. Schwarts de hyd. ejusque specifico meloë majali, et proscarabæo. Halæ 1783. Tilloch's Phil. Mag. vol. vi.

But, notwithstanding the chair of Natural History in that seminary is so ably filled, we learn from the two pieces before us that there is another Lecturer in Philadelphia, who has delivered Discourses in the hall of the University, on something of the same kind. This is Mr. Charles W. Peale, well known as the proprietor of the largest collection of Natural History in Philadelphia, or perhaps in the United States.

The account Mr. P. gives of himself and of his Museum is this:—His original occupation was portrait-painting, by which, if he had steadily pursued it, he might have grown wealthy. He, however, in the ardour of patriotism, became negligent of his profession, and directed his attention zealously to the politics of his country. But, at length, growing weary of political warfare, he determined to select some private and peaceful pursuit, and after pondering maturely what it was best for him to do, resumed his pencil, and painted a collection of the portraits of men who had distinguished themselves in the American revolution. Having made considerable progress in this undertaking, he was prevailed upon by one of his friends to exhibit, in a corner of his picture gallery, some bones of the Mammoth, then recently discovered, and attracting admiration. From this beginning, first under the countenance of some respectable characters, and afterwards by the voluntary contributions of individuals, as well as by his own unremitted exertions, and without the aid or patronage of any Legislature whatever, has Mr. Peale's collection of natural objects been increasing until this time, and growing to its present large and interesting size.

After having been many years engaged in collecting and arranging the different natural productions which came into his possession, and in describing and explaining them to the persons who visited his Museum, Mr. P. seems to have entertained an opinion that he might be employed, agreeably to himself, and, perhaps, to others, by delivering regular lectures or discourses on a department of knowledge he had cultivated so long. The scheme of instruction, therefore, attempted by him, appears to have a particular reference to his own collection, and not to be undertaken upon the broad and scientific plan which distinguishes a university-course. It may thus be understood wherefore he was liberally permitted to deliver his lectures in the college hall, and to disclose whatever he knew of Natural History, and that this might be done without interfering with the regular and systematic labours of the Professor.

The lecturer laments his having begun to attend to Natural History at a late time of life. He informs his hearers that he never attended lectures on the subject, and that he has read very few books. From these confessions our readers will naturally form a judgment of the author's genius and turn of mind, and anticipate any opinion of ours, by concluding, that with the best intentions, and the most lively zeal for cultivating Natural History, Mr. P. has laboured with remarkable success; but that his great excellence consists rather in collecting, preserving, and exchanging specimens, than in philosophizing upon them.

When we consider that Mr. P.'s Museum contains specimens, in good preservation, of many of the quadrupeds, birds, amphibia, shells and insects of America, conveniently arranged, and reflect how necessary it is to a student of Natural History to have the real objects before him, we are led to conclude that this collection affords many advantages to the zoological inquirer. And, as far as his fossils extend, the study of Mineralogy may be, in like manner, promoted.

For the work of gathering from their scattered sources the natural productions of America, and exchanging a part of them for the proper specimens of the other parts of the world, the writer of the pieces before us seems eminently qualified, and, indeed, to stand without a rival. In this we wish him prosperity; and in this wish we are the more earnest, since an untimely death, in 1798, bereft us of Mr. Baker, whose distinguished taste and singular enterprize had been manifested in a handsome cabinet of curiosities at New-York.

The style of these Lectures is very plain, and the matter miscellaneous and desultory. We, however, select one passage, which so delightfully shows the effect of scientific pursuits to civilize the mind, and subdue its fiercer passions, that *on these accounts* they deserve the highest encouragement. Speaking of his Museum, he says—

"One very important effect may be produced: Persons having different sentiments in politics, being drawn together for the purpose of studying the beauties of nature, while conversing on those agreeable subjects, may find a concordance of sentiments, and, most probably, from a slight acquaintance, would think better of each other than while totally estranged. An instance of this is in the memory of many of my hearers. The chiefs of several nations of Indians, who had an hereditary enmity to each other, happened to meet unexpectedly in the Museum in 1796. They re-

garded each other with considerable emotion, which in some degree subsided, when, by their interpreters, they were informed, that each party, ignorant of the intention of the other, had come merely to view the Museum. Never having before met but in the field of battle, where the recollection of former scenes of bloodshed only roused the spirit of revenge, no room was left for the feelings of the social man. Now, for the first time, finding themselves in peace, surrounded by a scene calculated to inspire the most perfect harmony, the first suggestion was—that as men of the same species they were not enemies by nature, but ought for ever to bury the hatchet of war.

"After leaving the Museum they formed a treaty so far as their powers extended; and wishing the white people to be witnesses to the sincerity of their intentions, at the request of the Secretary at War I supplied them with a room. Sixty-four chiefs of eight or ten nations met: they heard a speech sent by General Washington, recommending peace. Their orators spoke, and they departed friends.

"Quarrels in politics are something like those in matrimony, almost always about trifles; seldom on things of consequence: each comparing their notes with candour, their differences are soon settled."

ART. V. *A Treatise on the Human Teeth, concisely explaining their Structure, and Cause of Disease and Decay: To which is added, the most beneficial and effectual Method of treating all Disorders incidental to the Teeth and Gums; with Directions for their judicious Extraction, and proper Mode of Preservation: Interspersed with Observations interesting to, and worthy the Attention of every Individual. By* R. C. Skinner, *Surgeon Dentist.* 8vo. pp. 26. *New-York.* Johnson *and* Stryker. 1801.

TRAVELLERS from Europe have long remarked the frequency of decayed teeth in America. They have wondered what there was in the climate of the western world, or in the constitution of its white inhabitants, so unfriendly to these organs of mastication. And they seem generally to have thought it a token of the degeneracy of the race of transatlantic emigrants. Some of their philosophers had persuaded them that animal life was not so vigorous and thrifty in the new world as in the old; and the premature loss of their teeth ap-

peared to those speculative gentry an indication of the puny and debilitated habits of the colonial descendants. But these were only effusions of learned and visionary pride, and no considerate zoologist or well-informed naturalist heeds them any more.

Without, however, ascribing it to the unfavourableness of the climate, or to a dwindling of the race of men who dwell in it, there is very good evidence of the fact, that bad sets of teeth have been heretofore very common. Attempts have been made to account for this from the variableness of the seasons, the sudden transitions of the weather from hot to cold, and from moist to dry—the frequency of catarrhal and rheumatic affections, and, consequently, of inflammatory diseases in the throat and jaws, and spreading thence to the teeth. That these causes have an extensive operation there can be no doubt. Pains in the upper and lower maxillary bones are frequent subjects of complaint. Inflammatory affections of the face are sometimes very violent; and the teeth partake deeply of these disorders of the neighbouring parts. As the bony portions of the teeth are furnished with blood-vessels, they are, of course, subject to inflammation, suppuration, or caries, like other vascular organs. From such *internal* causes are the teeth subject to inflammation and decay. And it is presumable they more frequently occur in our variable situations than in the more equable and temperate regions of the globe.

But the teeth of human beings suffer *external* as well as *internal* injuries. They may be broken by *mechanical* force, and worn away by attrition; or *chemical* agents may corrode them, and spoil their structure. The latter is the more common occurrence; and, under the disorganizing operation of active solvents, the stony covering of the teeth disappears. Our readers will turn to our Med. Rep. vol. ii. p. 451, 1st edit. for a full statement of the facts connected with the external decay of the teeth. It is there remarked that these bony excrescences consist chiefly of phosphoric acid and lime, and are, of course, phosphates of lime. Several acids have a stronger attraction for lime than the phosphoric acid has: consequently, when these acids—such as the acids of sugar, tartar, sulphur, &c. come in contact with the teeth, they decompose the enamel, by combining with the lime and discharging the phosphoric acid. In proportion as these acids are applied to the teeth frequently and long, will their enamel be more quickly or slowly eaten away. The most common and de-

structive of the acids is produced within the mouth itself, from the remains of lean meat, bread, and other substances, sticking between the teeth, and settling near their junction with the gums. This is the SEPTIC ACID, which, if not neutralized or washed away, will, within a foul mouth, do irreparable damage in a short time.

The case is different when alkalies come in contact with the teeth. The phosphoric acid has a stronger attraction for lime than for alkalies; therefore no destruction of the teeth can be wrought by this class of substances. While they are thus perfectly safe from injury by alkalies, the corrosive acids by which they are often beset and surrounded are neutralized and rendered innoxious. On this principle it is that a correct theory of their *external* diseases may be formed, and proper methods of prevention devised. (Med. Rep. vol. ii. p. 454, 1st. edit.)

The author of the piece before us is by profession a dentist, and his object is to communicate information concerning the natural situation of the teeth, their diseases, the remedies for these, and the means of prevention; together with such chirurgical operations, and other artificial expedients, as his experience has led him to believe are useful. His description of the anatomical structure of the teeth and their sockets contains nothing new: nor do we find any thing peculiarly striking in his account of their diseases. Yet as tooth-drawing is an operation to which most persons, at some time of life, are obliged to submit, we think it may be acceptable to our readers to lay before them Mr. Skinner's practical directions for extraction in his own words: (p. 20.)

"The various construction and situation of the teeth require instruments of various forms, applicable to their construction and situation. The judicious experienced operator is abundantly supplied with these, and when a case occurs that requires his professional assistance, he knows how to select and apply such as are adapted to the case advantageously. On the contrary, the uninformed *would-be operator* seldom possesses, or knows the use of any other instrument than a common turn-key, which he applies in all cases, and with his herculean strength *murderously turns out*, either some part of the tooth, or a large piece of the jaw-bone, and too frequently two or three sound teeth. A tooth ought invariably to be drawn in the direction of its own axis; or, in other words, in a straight direction from its natural situation, which gives but little pain, and obviates accidents. A tooth stands in the jaw something similar to a wooden wedge drove [*driven*] firmly into a stick

of wood, which, by moving in any other direction than straight forward, will inevitably either break the wedge and leave the point within the stick, or split out one side or the other of it; but by moving the wedge in a straight direction, avoids both one and the other; and so vice versa the teeth. In extracting a tooth, the operator should always first thoroughly separate the gum from the tooth with a gum lancet. The selection of the extracting instrument must depend entirely on the judgment of the operator: it ought always to be adapted to the *construction*, [shape?] *size*, and *situation* of the tooth that is to be extracted. In all cases, however, a tooth ought to be drawn straight forward, and never, on any consideration whatever, should it be drawn laterally, or *turned out*. This may be easily effected by an operator that possesses the instruments and understands the proper method. The extraction of a tooth should never be very sudden or quick. The patient should be placed either on a high or low seat (as the case requires) when the instrument is applied to the tooth; and before an attempt is made to draw, the operator should feel that he has a firm, secure hold of it: satisfied of this, he must then draw steadily in a straight direction of the natural position of the tooth; and if the strength of his right arm is insufficient to effect its removal, his left must assist. When an upper molaris or grinder is to be extracted, the patient should be placed or seated very low, with the head resting upon the operator's knees. If an under one is to be removed, the patient should be placed on the height of a common chair, and the head placed upon the operator's breast, who should firmly and securely clasp it with his left arm. These positions effectually secure the patient from struggling, and thereby retarding or preventing the successful completion of the operation—brings both the operator's hands in front of the patient's face—enables him to apply the strength of both, if necessary, and consequently to remove the tooth, in the direction before mentioned, with ease, safety and success. If an incisorius or caninus is to be extracted, the patient must be placed in the same situation as for the removal of the molares, with the difference of reversing the positions. But a front tooth ought never to be extracted unless an abscess is formed at the root of it. A judicious operator can always ascertain this, from circumstances and external appearances. A tooth with one fang or root, that gives pain from any other cause than an abscess, can easily be cured and rendered serviceable oftentimes during a person's life.

"If a front tooth is extracted, it generally produces a con-

traction of the parts from whence it was removed, and, consequently, draws the mouth partly on one side. Independent of this circumstance, it would be bad practice to extract a front tooth, or stump, because it would remove and destroy that solid base indispensibly necessary for the firm security and masticating use of an artificial tooth, which may be set to very great advantage where there is a solid stump standing."

The pamphlet concludes with announcing the author's dentifrice and tincture for preserving the teeth and gums, and the various operations which he performs, with their prices. We refer those who desire particular information on the latter of these subjects to the publication itself. And as to the former, knowing, as we do, that this tooth-powder is a composition of *alkaline* and *calcareous ingredients*, very finely levigated, we are of opinion it may be serviceable in overcoming the injurious acids by which the teeth are assailed, and of keeping them in a clean, sound, and beautiful condition.

ART. VI. *Medical and Physical Memoirs, containing, among other Subjects, a particular Inquiry into the Origin and Nature of the late Pestilential Epidemics of the United States. By* Charles Caldwell, *M. D.* 8vo. pp. 296. *Philadelphia.* Bradfords. 1801.

HAVING, in our last number, examined Dr. Caldwell's "Address to the Philadelphia Medical Society, on the Analogies between Yellow Fever and True Plague," which, though not bearing the denomination of a memoir, is to be considered as belonging to the collection included in the volume before us, we now proceed to consider the four memoirs which form the remainder of the work.

The first memoir exhibits "A Physical Sketch of the City of Philadelphia, interspersed with general remarks, applicable to all large and populous cities." The second contains "Facts and Observations relative to the Origin and Nature of the Yellow Fever, addressed to the Citizens of Philadelphia." The third is "On the Winter Retreat of Swallows." And the fourth is devoted to "Strictures on Dr. Barton's Memoir concerning the Disease of Goitre, as it prevails in different Parts of North-America."

The subject of the first memoir, viz. "A Physical Sketch of the City of Philadelphia," &c. is treated in a manner which makes it interesting not only to the physicians and inhabitants

of that city, but, in a great degree, to those of all other large and populous cities, and especially to such as have many circumstances in common with those of Philadelphia. We perfectly agree with the author in the necessity of an accurate acquaintance with the topography of the places visited by pestilential diseases, in order to form a correct opinion of the origin and nature of such diseases. The progress of medicine has been greatly retarded by inattention to this point. If to the knowledge we possess of the ravages of pestilence at Constantinople, Aleppo and Grand-Cairo, as well as among armies and other forms of crowded population in the countries adjacent to these cities, had been added a minute topographical account of such places, with a description of diet, dress, and other modes of living, our acquaintance with the epidemics of the east would have been infinitely more exact and profitable than we now find it. In all probability the doubts still entertained on this subject will vanish as soon as the information before-mentioned is satisfactorily obtained. Physicians are growing sensible, at length, of this desideratum; much has been already done to supply it; and we are happy to find Dr. Caldwell so commendably labouring in this plan of reformation.

In the first section of this memoir Dr. C. treats of the climate of Philadelphia, and its effects on the human system. He thus describes it:

"Philadelphia, like every other large and populous city, possesses a factitious climate of its own, different from the climate of the surrounding country. This difference, in summer, is equal to that resulting from a difference of several degrees of latitude. In winter, I believe (though of this I will not speak confidently, having made but few comparative experiments on the subject), the atmospheres of the city and country are more nearly alike in point of temperature.

"The summer climate of Philadelphia, and of other large cities similarly situated, is an artificial torrid zone, in which the thermometer rises from four to six degrees higher than it does at the distance of a few miles in the country. The causes of this superior degree of warmth in a city atmosphere appear to be the following:

"1. The heat given out from numerous and crowded fireplaces.

"Each fire in the city communicates its heat to a certain distance around it. Hence the aggregate result of the whole must be considerable.

" II. Heat evolved by the process of fermentation in all its stages, the sources of which are much more abundant in the city than in the country.

" III. Heat thrown out by animal respiration and perspiration.

" The extent to which these functions go on in the city, compared to what occurs in an equal space of atmosphere in the country, is, perhaps, in the ratio of a thousand to one.

" IV. A less free circulation of air in the city than in the country atmosphere.

" Though this is not, in itself, a powerful cause of the actual evolution of heat, yet, by allowing the warmth of our own bodies, as well as that produced by adjacent objects, to be accumulated round, and to remain in contact with us, it proves a very fruitful source of the distress we experience from the summer temperature of the city.

" But farther, as rest is absolutely necessary to every stage of fermentation, there is reason to believe that air, when stagnated, is much more favourable to this process than when in a state of active motion.

" V. Less evaporation from the surface of the ground in cities than what takes place in the country.

" A deficiency of moisture in the earth, and a consequent deficiency of aqueous exhalation, are among the most powerful of those causes which co-operate in producing the extreme heats of the desert of Arabia, and of other sandy regions bordering on the line. But streets that are paved with flint, and overspread with dry dust, as is the case with the streets of Philadelphia in the summer season, are equally unfavourable for this cooling process.

" If, on the other hand, the dust were swept away, and the silicious stones exposed without a covering to the rays of the sun, instead of vapour carrying off heat in a latent state, nothing but reflected light, accompanied by sensible heat, would arise, to the great augmentation of the warmth of our atmosphere.

" VI. The last cause of the high temperature of city atmospheres, which I shall mention, is, perhaps, more powerful than all the rest. It is the many solid and opake substances in large cities that act on the principle of reverberating furnaces, by intercepting and reflecting the rays of the summer sun. Such, in particular, is the operation of the buildings and the pavement of the streets.

" In passing through a clear atmosphere, or any other trans-

parent medium, the rays of the sun produce no perceptible degree of heat. The case, however, is different as soon as they fall on an opake body. The surface of the intercepting obstacle becomes immediately heated, and communicates its warmth to the surrounding air.

"If, on being reflected from the first, the rays impinge against a second substance, this becomes in like manner an additional source of heat. A third point of reflection becomes a third source, so that the number of such sources will be in a direct ratio to the number of opake bodies against which the sun-beams strike, either by primary incidence, or subsequent reflection. But, as bodies of this description are, both in dimensions and number, greatly superior in cities to what they are in the country, the heat from this cause must consequently rise in something of a similar proportion.

"Nor is the nature of certain reflecting bodies in cities to be passed unnoticed in the present inquiry. Our glass windows, when struck obliquely by the rays of the sun, act as so many mirrors, by throwing them into the streets in a condensed state.

"To the foregoing causes may be added the state or constitution of a city atmosphere itself. Being more highly charged with heterogeneous substances than the atmosphere of the country, it is less transparent, and probably, therefore, by making some resistance to the passage of the rays of the sun, gives rise, on this principle, to a farther evolution of heat.

"Perhaps the truth of this observation can be best realized, and its force most readily felt, by taking, in the evening, a distant view of the atmosphere of a large city. In this way, the want of transparency in this body of air is rendered extremely obvious. The city appears to be enveloped, not, indeed, in a real cloud, but in a body of atmosphere so surcharged with smoke and other effluvia, as to be able to reflect a sufficiency of light to render itself visible.

"It is, no doubt, by viewing this phenomenon in times of pestilence (periods in which men's minds are unusually awake to observation), that weak and superstitious characters have been led to imagine large cities overhung, on such occasions, by clouds portentous in aspect, and manifesting the frowns of an offended Deity.

"Can the density of a city atmosphere act, in any measure, the part of a convex lens, and increase the temperature by a slight condensation of the rays of light?"

In the second section Dr. C. exhibits the situation and extent of Philadelphia, with their probable operation in the production of disease.

The third section contains remarks on such works of art in Philadelphia as appear to have an influence on the health of its inhabitants. Under this head Dr. C. takes occasion to examine the prevailing mode of constructing houses in this country, and censures it as an imitation of British customs, rather than an accommodation to the extremes of heat and cold to which we are annually subjected. He contends that the walls of our houses should be thicker, and the windows much smaller, and fewer in number, than common practice prescribes. There is no reason to doubt, that, on such a plan of building, our houses would be cooler in summer and warmer in winter. The effect of shutting up rooms during the heat of the day in summer, the coolness of subterranean apartments in the same season, and the warmth of them in winter, and, above all, the practice of whole nations inhabiting the warmer regions, seem to confirm our author's opinion. In the construction of cities Dr. C. thinks it proper that buildings should be lofty and streets narrow. If this were the case, the shade of the houses would protect the streets from the rays of the sun, and winds be rather quickened than retarded by the narrowness of avenues.

In the fourth section Dr. C. takes a view of the population of Philadelphia, with the mode of living, dress, customs and amusements of its inhabitants. With great reason, the habit of consuming large quantities of animal food, and of distilled and fermented liquors, in the summer and autumn, is condemned. In the diseases of these seasons it is well known that the abdominal viscera, more than other parts of the system, are liable to suffer from morbid determinations to them; and there can be no doubt that the author's opinion of the tendency of stimulating diet, by excess of excitement, to debilitate such viscera in an especial degree, is well founded. In this instance likewise Dr. C. laments that Americans have not been hitherto able to emancipate themselves from the tyranny of British habits, and to adopt a plan of diet suitable to the temperature and other circumstances of the region which they inhabit. Many other nations, whose pretensions to improvement are far inferior, have long since been taught, by experience, to avoid the evils which we suffer, and which our European prejudices alone induce us to cherish.

In the fifth section Dr. C. concludes this memoir by some general inferences and remarks, which are properly deduced from his preceding observations, and will, we are persuaded, appear to his readers to be judicious and interesting.

(To be continued.)

ART. VII. *Transactions of the American Philosophical Society, &c.*

[Continued from page 412 of vol. iv. and concluded.]

An Answer to Dr. Joseph Priestley's *Considerations on the Doctrine of Phlogiston, and the Decomposition of Water; founded upon demonstrative Experiments. By* James Woodhouse, *M. D. Professor of Chemistry in the University of Pennsylvania, &c.*

IT was our design, when we began the review of this volume of the Transactions of the American Philosophical Society, to give a particular account of this respectable paper. The place which it holds, however, in the order of the contents of the volume, has prevented our arriving at it so soon as we then expected. As it treats *of the constitution of metals—of the solution of iron in the diluted sulphuric and muriatic acids—of finery cinder or the scales of iron—of carbonic acid or fixed air—and of nitric acid*—it will be in the recollection of all our readers that the controversy on these subjects has been so essentially varied and narrowed by subsequent discussions, which have taken place between Dr. Priestley and Dr. Woodhouse in the Medical Repository, as to render it less proper at present to enter into an examination of this paper. It will be sufficient to observe that Dr. Woodhouse states the principal points in question between the phlogistians and antiphlogistians with great distinctness and candour; that he combats the opinions of Dr. Priestley with much force and ingenuity; and that, throughout the whole, as on other occasions, he manifests a degree of respect for his venerable opponent which reflects equal credit on the character of both.

An Essay on a new Method of treating the Effusion which collects under the Scull after Fractures of the Head. By J. Deveze, *Officer of Health, of the first Class, in the French Armies.*

The operation of the trepan is sometimes required to relieve that effusion between the dura mater and the scull, occasioned by injuries of the head. The difficulty of ascertaining precisely the spot where the effusion is accumulated, often makes frequent repetitions of the operation necessary.

To avoid this inconvenience, the author proposes to destroy the adhesion which unites the dura mater to the scull, and

establish a communication between the collected blood and the opening already made by the trepan. He relates a case where he performed this operation with a silver spatula, very flexible, the extremities of which were rounded. He took the precaution to press it towards the bone, and to bend the instrument by degrees as it was introduced, to make it take the form of the part upon which it acted; and often he drew it back, to measure, on the outside, the way it had made. At length he happily reached the part where the blood was collected, which flowed in great abundance, and the patient was soon relieved.

MEDICAL & PHILOSOPHICAL NEWS.

DOMESTIC.

PESTILENTIAL VIRUS GENERATED AMONG EMIGRANTS FROM IRELAND, AND OVERCOME BY ABLUTION WITH SOAP AND ALKALIES, AND BY VENTILATION.

WE have heretofore stated the difference that exists between *contagion*, which is a product of morbid secretion, and *infection*, which, without any vascular action at all, is engendered in certain inanimate substances by putrefaction. To the former of these belong the virus of small-pox, lues, vaccinia, and the like; and to the latter, the poison which induces fevers of various forms, as intermittent, bilious, malignant, pestilential, typhus, yellow, plague, and others. (Med. Rep. vol. ii. p. 314, 1st edit.) And we have stated it repeatedly as the result of all well-directed science, and all the valuable practice we knew on the subject, that wherever this poisonous offspring of corruption existed, it might be overcome by ablution, ventilation, soap, alkalies and lime. (Med. Rep. vol. ii. p. 361, 1st edit.) This season (summer 1801) has afforded new proof of their entire efficacy, without any of the fumigations with cedar-smoke, salt-petre-vapour, or muriatic acid gas, so warmly recommended in some of the modern publications.

Several ships which had carried flax-seed to Ireland returned in the months of June and July to New-York, crowded with needy and wretched emigrants from that island. They were so thick between decks that the air was deprived of its usual portion of oxygen, insomuch, that on bringing the sick passengers to shore, the common pure atmosphere was too stimulant for their lungs, and a number of them gasped in it, and died in a short time. There was so much animal excrement accumulated in one of the ships, that the health-officer detained her at the quarantine ground as poisonous and pestilential, and refused to let her come up to the city. By the pukings and purgings, and by the urinary and perspiratory discharges of these miserable creatures, literally wallowing in their own filth, the bodies of many of them were besmeared and incrusted, forming a layer of excrementitious grime from head to foot. Their clothing and their bedding were in-

pregnated with as much of these excrementitious matters as they could wipe from the bodies of the passengers and absorb. And with such coverings, vile, offensive and pestilential in the highest degree, were they surrounded. And these excrements, infesting every thing in the neighbourhood of the sick, underwent the usual chemical changes in a heat nearly or quite equal to the human body, and turned to septic acid, or to some other septic and poisonous matter, which forms the exciting cause of fever. Of the fever so excited, between thirty and forty from one ship died in crossing the Atlantic, and were thrown overboard. The survivors arrived in a state of uncleanness, sickness and want, seldom seen in America, but among the emigrants from that unhappy country, who make so large a number of the poor in American hospitals and alms-houses. So thoroughly contaminated with their own corrupting excretions were the clothes and beds of these sufferers, that the septic exhalations from them poisoned the air of the Marine Hospital on Staten-Island, and the medical attendants and nurses sickened in the discharge of their humane attentions.

The common opinion of physicians concerning this venomous matter is, that it is a *contagion proceeding from human miasmata.* It did arise from human excretions to be sure; but only in consequence of a conversion of them to poison by chemical action going on among their particles, as in any other inanimate matter: and vascular living action, by which contagion is formed, had nothing to do in the business. It might be said, and the hypothesis of contagion requires it to be said, that this contagion was imported from Ireland! But there is neither truth nor reason in this assertion. There is no contagion in the case; and if there was, it was not taken on board in bulk at Newry, Belfast or Londonderry. The poison which excited these fevers was engendered on board the ship, in this as in other instances, from their accumulated and putrefying excretions. The same matters which render shirts, drawers and stockings *disagreeable* to the wearer after two or three days, will render them *pestilential* after five or six weeks close and incessant application to the skin. And the same is true of bedding. The process which a washerwoman employs to cleanse linen *after three days* wearing, will cleanse it after being worn *a month and a half.* And the two cases differ but *in the degree of nastiness and infection.* And the process which a chambermaid uses to purify the floors, furniture and walls of a house, will

purify the decks, equipage and planks of a ship. *Both houses and ships are human habitations*, and become foul in a similar way. There is no mystery in the transaction, except among professors, legislators, philosophers and physicians. The plain understanding or common experience of female labourers has undeniably proved, that the foulness of clothes and houses is to be removed by soap, ley and lime.

It is happy for mankind when philosophy travels the path of common experience. Mr. BAYLEY, the health-officer of the port of New-York, has, this season, as on several former occasions, set a noble and praise-worthy example of adherence to this *good old method* of removing foul and offensive matter, and its concomitant septic poison, from the bodies and clothing of the sick. The mode he adopted in the case of the Irish emigrants was this, which, after confirmation year after year, we publish, with pride and pleasure, to the whole medical, commercial and political world, for their imitation. He caused the sick, after landing, immediately to be distributed or separated from each other as widely as the circumstances would allow, that their pestilential exhalations might be diluted, and wafted off. He ordered their nasty clothing and bedding to be carried away from their persons, and that part of both which was too poisonous, ragged and rotten to be worth the cleaning, to be burned or thrown into the Bay. He directed the bodies of the sick to be purified by careful ablution and scrubbing with a *solution of soap* in water; and even the heads of some of them to be shaven. After these things were done, the sick were furnished with clean clothing and bedding from the public store. The walls of the hospital were repeatedly *white-washed with lime*, and the floors and utensils *scrubbed with alkaline ley of pot-ash*. So offensive and intolerable were many of these languishing creatures, that they were accommodated under large tents, for the benefit of more complete airing. And it was remarked that the ground on which the tents were pitched grew too unsafe, in a few days, to be dwelt upon any longer, and the tents were removed, and erected on fresh portions of earth. In such cases the envenomed and deserted spot was regularly sprinkled over with *lime*. The health-officer, knowing that hard or bar-soap was made of *soda*, and contained, withal, as manufactured in New-York, a large quantity of turpentine, which only added to its weight, without increasing its virtue, procured for the use of the wash-house a stronger soap, made of the more powerful alkali, *pot-ash*, combined with just enough

of animal fat to lessen its causticity so as to bear handling. With this very efficacious soap, and not with the common mixture of turpentine, slush and soda, in the shops, were the remaining clothes cleansed and alkalized.

The consequence of this management was, that as soon as these regulations could be carried into effect, the pestilential vapours were dispersed through the surrounding atmosphere—, a vivifying air was admitted into the lungs—the pestilential matter adhering to the bodies and clothes was alkalized and overcome, and poisonous effluvia issued from them no longer. And whatever infection might have been communicated to the floors and walls was instantly neutralized by the *ley and lime* with which they were charged. Thus the venom was gradually subdued, and the virulence of this plague in a few days perfectly died away.

It is worthy of particular remark, in this as in other cases of similar distempers among us, that of the medical attendants and nurses who fell sick, not a single instance occurred of the communication of the distemper from them to second persons. They were poisoned themselves by septic acid gas; but the disease occasioned thereby, like the disease caused by carbonic acid gas, was found to be not specifically communicable.—And it is further worthy of being remembered, that emigrants from Ireland, landing immediately in the city, instead of being detained at the Marine Hospital, filled New-York with death and terror in 1795. The benevolent and philosophical gentlemen of Ireland would be worthily employed in preventing these calamities, if possible, among their countrymen, and thereby relieving the United States from such shocking scenes.

INFORMATION CONCERNING HYDROPHOBIA.

Besides the case of this terrible disease drawn up by Dr. Physick (see 1st page of our present number), and the discussion of several controverted questions relative to it, by Dr. Mease (p. 50), we have several other articles of intelligence to communicate. The rabies among dogs, in the city of New-York, has, within a few months, been unusually prevalent. In March, 1801, there was an alarm among the inhabitants, occasioned by mad dogs, as was said, running through the streets, and biting other dogs, swine and men. Several were pursued and killed. During the month of July there have occurred several instances of hydrophobia terminating fatally, in consequence of the bites inflicted in March. In the latter

part of June and the beginning of July, the alarm from mad dogs, which had for a time subsided, was renewed, and several more rabid animals of this species were destroyed. The Common-Council of New-York, anxious for the quiet and safety of the inhabitants, judged it necessary to restrain the dogs with which the city abounded, and passed the following ordinance

"*To prevent the going at large of Dogs in the City of New-York.*

"Be it ordained by the Mayor, Aldermen and Commonalty of the city of New-York, in Common-Council convened, on the 13th day of July, 1801, that no dog shall go at large, in any street or road in this city, nor in any other place in this city where people pass or resort to, between the fifteenth day of July instant, and the first day of November next. And if any dog shall be found going at large, contrary to this law, the owner or possessor of such dog shall forfeit and pay as a fine *five dollars*. And further, that it shall be lawful for any person to kill any dog which shall be found going at large."

Unfortunately it happens that prevention is almost all that can be done effectually against this violent and intractable disorder. Many facts, indeed, are known concerning it. But as many more remain to be known, we communicate the following pieces of information to our readers, with the hope that they may contribute somewhat towards the right understanding of so intricate a subject.

The analogy between hydrophobia and yellow fever is strongly evinced by the following case, in which black-vomiting came on toward the fatal close of the distemper.

Case of Hydrophobia, communicated by S. Borrowe, M. D. of New-York.

"On the evening of the 11th of April, 1801, I was requested to attend a son of Col. B. Swartwout, a boy of nearly thirteen years old, who, half an hour before, had been bitten in the left fore-arm by a dog supposed to be mad. I immediately employed ablution, and continued it for more than a quarter of an hour; after which I dressed the wound with strong mercurial ointment, and directed the arm to be freely rubbed with it. Every fourth hour he took calomel and opium, together with wine and generous diet. In a few days a ptyalism was produced, which continued for more than two weeks.

Lunar caustic was frequently applied, which, with the common poultice, kept the wound open for better than a month. As the dog was not known to be mad, and the boy had not had any unfavourable symptoms, he was now permitted to discontinue the preventative plan, except wine and cordial diet, which he continued, though not in such great quantities.

" He appeared now to be in perfect health, and remained in that state until the third day of July in the afternoon, when I was again requested to make him a visit. He complained of considerable pain in the left arm and shoulder, somewhat similar to rheumatism; said he had passed several restless nights, and that he was very costive. I directed the pained parts to be bathed with volatile alkali, and gave him a dose of pulvis purgans, which had the desired effect.

" On the 4th, early in the morning, when a bason of water was brought to him for the purpose of washing, he directed it to be removed, as it made him uneasy to look at it; he, however, attempted to wash himself, but on putting his hands into the water, discovered great alarm, and left it with horror. He was then offered some common tea at the breakfast table, which he found great difficulty in swallowing. At ten this morning I found him labouring under all the symptoms of distinctly marked hydrophobia. The part where the wound was received, which had been long since healed, was now of a darker colour than before; his countenance was remarkably pallid; the pulses were small, and intermittent; his skin rather below the natural temperature: the pupils were somewhat dilated, attended with some little confusion of intellect. He complained of the air being extremely unpleasant to him when the door of the room was opened: the light also gave him uneasiness—light-coloured objects were particularly disagreeable to him; looking at which, he said, made him sigh.

" Dr. Post was requested to visit the patient at eleven, at which time we ordered a blistering-plaister to be applied to his throat, and one to that part of the arm where the wound had been inflicted. He took two grains of calomel and one of opium every fourth hour, together with bark, ginger, and cloves; had ten grains of calomel applied to his gums every second hour; took some animal food, and drank freely of wine. At 8 in the evening his blisters had acted powerfully; his pulses were stronger, and regular; he could drink with more ease: his intellect was more clear, and he discovered less horror at the sight of fluids.

"Dr. Tillary saw him, for the first, this evening. His medicines were continued.—He slept but little.

"5th. At nine in the morning the hydrophobia was much increased. On offering him any fluid he would scream out aloud, hide his head under the clothes, and then attempt to jump out of bed. Although he complained of being extremely thirsty and hungry, he could neither swallow liquids nor solids. Whenever he attempted it, particularly fluids, the muscles of the throat and face were most violently convulsed, and he appeared as if he would immediately suffocate. If a particle of the saliva, which he was constantly throwing out, touched the surface of his body, or he saw it, his spasms were renewed. At one o'clock we requested Drs. Miller and Hosack to visit the patient. His symptoms were now somewhat abated. The same tonic and stimulant plan of treatment was advised to be pursued: in addition to which warm brandy was applied to the region of the stomach and abdomen.

"6th. The symptoms continued the same, except the delirium, which was considerably increased. We directed him to take thirty drops of the tincture of cantharides every hour. This was continued through the day without producing any sensible effect. In the course of this night he was seized with great uneasiness at his stomach, and threw up considerable quantities of dark-coloured matter.—Little or no sleep this night.

"7th. At six this morning he refused every kind of nourishment. His delirium was greatly increased, and strength much exhausted. He had now the black-vomit, accompanied with a constant discharge of saliva.—Twelve o'clock at night he died.

"8th. At nine this morning I opened the body, in presence of Drs. Post, Miller, and Tillary. The intestines were much inflated. The smaller contained a considerable quantity of black matter, similar to that which he threw up the preceding day. The stomach was collapsed and empty, except a small quantity of dark flaky matter which adhered to the villous coat. The greater part of the internal surface of the stomach appeared to be much inflamed; and one spot, near the cardia, had the appearance of blood effused beneath the villous coat."

Case of Hydrophobia, communicated by John R. B. Rodgers, M. D. Professor of Midwifery and of Clinical Practice in Columbia College.

"J. Opie, a boy of thirteen years of age, was, on the first of April, 1801, bitten by a dog (supposed to be rabid) on the

upper part of the nose and inner angle of the left eye. He was, on the afternoon of that day, sent to a person in New-Jersey, who was said to possess a remedy preventive of hydrophobia. By him he was treated, had some internal remedies administered, and the wound dressed, but with what particular application is not known. In a short time (less than a fortnight) the sore was healed, and the lad apparently in perfect health. He continued so till Friday, the 10th of July, when, in the evening, he complained of being feverish, and, on Saturday, of pain in the head. He had a large dose of castor-oil given him by his sister, which operated briskly, and relieved him much. On the evening of the same day he complained of some difficulty of swallowing fluids.

"On Sunday, the 12th, in the morning, I was first called to see him, and found him with a hot and dry skin, pulse at 110, and full, but soft; face flushed, eyes languid, and the countenance having the air of great dejection. He was sitting up; complained of a dull pain in the head, but no affection of the stomach, or sense of oppression there. Having been told that he had shown symptoms of hydrophobia the evening before, I offered him some water in a tumbler. He took it with one hand, and put it to his mouth with some reluctance. He then seized the vessel with both hands eagerly, and, making a considerable effort, swallowed about one gill. He said he did not want to drink, for it 'choaked him,' and, as he expressed himself, 'took away his breath.' I had no doubt of the disease, nor any of the termination of it; for I knew no remedy which could be relied upon. The family were apprised of his situation. And, in a few hours afterwards, I visited him again with my friend Dr. Miller.

"Having seen, in a vol. of the London Medical Review and Magazine, an account of the successful use of alkalis and opium in some cases of tetanus, and believing in the analogy of the two diseases, and in the utter inefficacy of any medicine hitherto employed for this dreadful disease when idiopathic, we were induced to pursue the plan which had been asserted to succeed in tetanus. For this purpose he took ten grains of salt of tartar every two hours, in one ounce of water, and one grain of opium at the same interval, alternately. He was put into a tepid bath at about 90 deg. with about ℔ij. of pot-ash, dissolved in as much water as just covered his whole body. The bath was advised of such a temperature as to be below the heat of his body, and to be repeated every three hours. In the evening, at seven o'clock, his pulse was 100. He com-

plained of being heated. The opium was omitted; bowels had been restrained by the opium. He was advised to have his throat and breast rubbed with a solution of camphor in olive oil, in the proportion of ʒss. of the former, to ℔j. of the latter: this to be done when he came from the bath.

"13th, A. M. Pulse quickened to 118. Bath had frequently been used in the night, and the alkaline solution diligently given. His difficulty of swallowing fluids increased; complained of an uneasy sensation when the bed-clothes were suddenly raised, or a white handkerchief thrown over his face. On showing him a mirror, he viewed it without any repugnance. This plan was pursued through this day. In the evening the pulse was 120. He constantly expressed satisfaction from the tepid bath.

"14th, 7 o'clock A. M. Pulse 144: heat then increased: more uneasy and restless: difficulty of swallowing greater. A blister was applied to the throat. His head was directed to be shaved, and washed with iced water for some time, and then covered with a large blister.—Seven o'clock P. M. Pulse very quick (150): skin growing cold. The alkaline course had been as steadily used as before. Blister to the throat had drawn well: but the directions with respect to the head had not been attended to. This evening he became frantic, though readily restrained from doing harm. After about five hours he was calm, yet delirious; and, continuing in this state, expired at four o'clock in the morning of the 15th. His skin became yellow after death, with many livid spots interspersed.

"On such a melancholy case I have little to say, for I know but little. The alkaline treatment, like all others that have gone before, has failed. Opium was not long continued, as it increased his heat.—We may conclude the contemplation of such a case with the words of Linnæus:

> 'Heu mihi! tot mortes homini, quot membra, malisque
> Tot sumus infecti, Mors ut Medicina putetur.'

Connected with the opinions herein under consideration, we insert Dr. Richard Pearson's letter to Dr. Mitchill, dated London, February 14, 1801.

"Sir,

"In a letter with which I was favoured last year, Dr. Rush informed me he had taken a totally new view of the disease termed hydrophobia, on which I published a small tract,*

* "Entitled, 'The Arguments in favour of an Inflammatory Diathesis in Hydrophobia considered.' London. 1798."

about two years ago. I was led to offer some remarks on the nature and treatment of this dreadful malady, in consequence of a fatal case which occurred at the hospital in Birmingham, where I then practised, but from whence I have since removed to the metropolis.

"The few remarks relative to this subject which Dr. Rush sent in the above-mentioned letter, made me very desirous of seeing the fifth volume of his Inquiries and Observations, to which he referred me. I have not yet been able to procure this book; but in the second volume of your Medical Repository I have had the pleasure to see an extract from the said work.

"I readily admit Dr. Rush's opinion of the near alliance of hydrophobia to the class of malignant fevers; and I think that the canine rabies might be not unaptly denominated *typhus hydrophobicus*. But while I agree with Dr. Rush on this pathological point, I must beg leave to differ from him entirely in regard to the treatment he prescribes when the disease is formed. His principal remedy is venesection. Now, if it be admitted that there is a real affinity between rabies canina and typhus, copious bleeding will surely be rejected on theoretical grounds; but, putting theory (as we ought) out of the question, fatal experience compels us to reject it. In my tract I have shown that the fullest trial of the lancet has been repeatedly, but vainly, made in every stage of the disease. In some of the unsuccessful cases, the quantity of blood drawn was astonishingly great. It cannot, therefore, be said that the remedy failed because it was not employed to a sufficient extent.

"In regard to the other remedies, such as purging *(moderately)*, glysters and sweating, I believe they are what most practitioners will assent to. Instead of blisters I have recommended caustics to the arms and thighs. They produce a more powerful and a more permanent action on the surface of the body, and, at the same time, are unattended by the peculiarly distressing irritation on the urinary passages which the cantharides occasion—an irritation carefully to be avoided in this disorder. As to the external application of cold water, the hydrophobic convulsions are so remarkably aggravated *by that, or any other fluid coming in contact with the body*, that I am persuaded it ought not to be used: yet I have no doubt that a reduced temperature, by lessening the excessive irritability, would have a beneficial effect.

"Attending to the state of the stomach (as denoted by the patient's feeling, and as detected after death), I have recom-

mended strong aromatics (and particularly capsicum) wine, ipecacuanha (in small doses, as a diaphoretic), and, lastly, the Peruvian bark. And the more I reflect on the nature and phenomena of rabies canina, the more I am satisfied of the propriety of this plan of treatment.

"I am, Sir, with great respect, yours,

"RICHARD PEARSON, M. D.

"*P. S.* Dr. Fothergill has lately published some observations on hydrophobia in the Memoirs of the Bath Agricultural Society, wherein he endeavours to prove it to be a species of angina. There is no doubt that it is sometimes accompanied by sore-throat, like other malignant fevers; but I have adduced numerous facts which evince that it is an accidental, and by no means a constant or essential symptom. Dr. Fothergill's observations were written, though not published (the papers lying long in the hands of the society), before my pamphlet appeared."

The kindred nature of hydrophobia and malignant fever is not a mere speculative notion. Practical observation confirms their similitude. This will appear by a case which occurred, in the autumn of 1798, in the New-York Hospital, under Dr. Mitchill's eye and prescription, wherein hydrophobic symptoms supervened the symptoms of yellow fever.

Nicholas Wager, a farmer from the town of Troy, aged 56 years, after having been unwell several days with the complaint of the season, was brought from his lodgings near Coenties slip, to the hospital, on the 25th of August, 1798. He had undergone some evacuations. At the time of his admission his tongue was dusky, and pulse moderately full: he had a rending pain across the forehead, and great distress at the heart. By degrees, however, he fell into that heavy and torpid state which so often accompanied the distemper. A variety of food and drink of a nourishing kind had been prescribed for him. On the 28th he became disinclined to take them; the whole quantity swallowed during the day amounting to no more than a few ounces of panada. The aversion to fluids increased until the next morning. The following extract from the hospital record exhibits his situation a little before he died: "He has continued very much agitated during the night, and an aversion to fluids came on. This is so remarkable as to be manifestly hydrophobic; for, on offering him drink at this moment, there was evidently an abhorrence of it; and on putting some lemonade, with a spoon, into his mouth, the pharynx was convulsed, and spasms extended thence along his arms:

symptoms of opisthotonos took place immediately after, and on attempting to raise his body the whole muscles of the back were rigid; while raised up the spasms of the pharynx were renewed, by attempting to give him some warm wine, which he was unable to swallow. His extremities are now cold, his pulse not perceptible at the wrist, and he appears under the spasms and tremors of departing life." He soon after expired.

IMPROVEMENTS IN THE NEW-YORK HOSPITAL.

By an arrangement made with the national government, this excellent asylum, in addition to its former plan, is become a marine hospital, and seamen who are not objects for the establishment for the sick on Staten-Island, are now freely admitted into it. This very much enlarges the field of medical and chirurgical practice, and affords advantages to students proportionally extensive.

An hospital had been established, in 1798, for the relief of poor pregnant women, as was announced in our vol. iii. p. 64; and it was incorporated by law at the next sessions of the Legislature. The institution was for some time in operation; but, on trial, it became evident to the managers that the good done was not commensurate to the expense. They therefore very prudently and humanely determined to assign their property in trust to the governors of the New-York hospital, on condition of having a lying-in ward established there. This has been agreed to, and a certain number of patients are regularly received. The lying-in ward is a part of the medical establishment of the hospital, though more particularly subservient to the purposes of the Professor of Midwifery in Columbia College. By this arrangement between the two establishments, the New-York Hospital has become a very instructive school of obstetrical practice.

The governors are attentive to the augmentation of the library, which is already a very valuable collection of ancient as well as modern books, on the various branches of the medical profession. Students are admitted to this upon easy and accommodating terms.

The surrounding ground has lately been inclosed with an handsome brick wall, and laid out in a style at once adapted to the airing and exercise of the sick, and to the raising of eatable and medicinal vegetables for the household. Besides these, it is now in agitation to adapt the hospital more extensively to the accommodation, management and cure of lunatics.

Inspection of pot-ash.

The great variety of forms and other qualities American pot-ash puts on, has rendered it necessary to subject it by law to an inspector, who shall judge whether it is merchantable or not. As to its *colour*, pot-ash is brown, red, black, yellow, white, cream-coloured, green and blue, with various stripes and mixtures of these. Its consistence is as various, being flinty, grained, unctuous, crumbly, frothy, scaly, honey-combed and crystallized, in different curious connections. Its adulterations are scarcely less numerous; for it is found to be blended with quick-lime, silicious gravel, granite, carbonate of lime, sulphate of lime, and muriate of soda; and the most of these are added for the purposes of deception by the manufacturers. The nice inspection of this alkali is not a very easy nor a very certain business. The man of science, who only has read elementary books, talks of pot-ash as a thing perfectly understood. But his ideas apply to the alkali in its pure state, and have very little reference to it, mixed and adulterated as it actually exists in the market. However, a less scrupulous examination suffices for the common purposes of trade.—As it appears to be a compound, there is another source of variety in pot-ash than the foreign ingredients mingled with it. And this is the different proportions of the constituent materials of the alkali itself, and their different degrees of attractive force; making various modifications of the salt independent of actual impurity. There is reason, too, to believe, that in some of its forms pot-ash associates with oxygen; for many samples of it, when examined by the inspectors, have *an acid flavour*, and *impart sourness to the organ of taste:* and this peculiarity is very familiar to them. These sorts of pot-ash are always of a very faulty quality. In short, this is a substance concerning which we have got a great deal yet to learn; and New-York, where it can be seen in all its forms during the manufacturing operation, and while it is undergoing inspection immediately after it is sent to market, is one of the best places for observing these things.

Thriftiness of the Sicilian wheat.

The committee of gentlemen appointed to cultivate the Sicilian wheat, mentioned in Med. Rep. vol. iii. p. 420, have distributed parcels of it to many parts of America. And it is pleasing to relate, that the accounts received from several cultivators are very favourable. The quantities raised, as yet, are too small to be carried to mill and made into flour; but it

is sufficiently ascertained that the plants will thrive and ripen their grain in our climate, and that the soil of the United States will bring it to perfection as well as that which surrounds the base of Mount-Ætna.

VOYAGES TO SOUTHERN GEORGIA.

This antarctic island, which is not classed by geographers with any of the eastern quarters of the globe, belongs properly to America. Though too cold and inhospitable for the permanent residence of man, it is much frequented by ships from New-York, and other parts of the United States, for the skins of the seals and the oil of the sea elephants which abound there. The harpoon has been thrown with such destructive success in every part of the Atlantic, that whales have become more scarce, and voyages for that species of game are less profitable than formerly. This has turned the attention of the whalemen to other prey; and Southern Georgia is now visited for the purpose of killing the seals and sea elephants which live and breed there in prodigious numbers, and have not, until lately, been much pursued or hunted by man. The havoc made among them must, notwithstanding their prolific powers, greatly thin their numbers, and diminish the species; and what expedient will be afterwards resorted to for oil is uncertain.

MEDICAL COMMENCEMENT AT PHILADELPHIA.

At a public commencement, held in the hall of the University of Pennsylvania, on Monday, the 8th of June, degrees of Doctor of Medicine were conferred on the following gentlemen, who presented and defended their respective Inaugural Dissertations.

Henry Wilson Lockette, of Virginia, on the Warm Bath.

Nathaniel Chapman, of Virginia, on the Canine State of Fever.

William Wyatt Bibb, of Georgia, an Inquiry into the Modus Operandi of Medicines upon the Human Body; to which are added some observations on the action of the lymphatics.

James Tongue, of Maryland, on the three following subjects: 1. An attempt to prove that Lues Venerea was not introduced into Europe from America. 2. An experimental inquiry into the Modus Operandi of Mercury, in curing the Lues Venerea. 3. Experimental proofs that the Lues Venerea and Gonorrhœa are two distinct forms of disease.

Samuel Gartley, of Philadelphia, on Bubonocele.

Thomas Semmes, of Maryland, on the effects of Lead, comprising a few experiments on Saccharum Saturni, and its application in the cure of diseases.

Jarvis Roebuck, of the island of St. Croix, experiments and observations on the Bile.

Benjamin G. Hodge, of the West-Indies, experiments and observations on the Absorption of Active Medicines into the Circulation.

William Stephen Jacobs, of Brabant, experiments and observations on Urinary and Intestinal Calculi.

William Brown, of Pennsylvania, on Uterine Hæmorrhage.

SKELETON OF THE UNKNOWN QUADRUPED.

The large fossil bones of which we gave some account in our vol. iv. p. 211, have been purchased by Mr. Peale, of Philadelphia. On putting them together, he finds they already amount to a considerable part of a skeleton. The proprietor intends to continue digging in the spot where they were found to obtain the remainder, and there is every reason to believe his attempt will be successful. From actual measurement, it now is ascertained that the animal to whom they belonged was between twelve and fifteen feet high. A complete skeleton of this enormous creature will be a grand addition to Mr. Peale's Museum, and tend to refute the opinion of some speculative philosophers, that the animals of the western continent are of a puny or diminutive growth. These bones, when put together, will prove that New-York has once supported the largest quadruped of which there is any description in zoology.

ANOTHER ETHIOPIAN TURNING TO A WHITE MAN.

In a letter to the editors, dated Lichfield (Connecticut), June 28, 1801, Mr. A. Catlin relates another instance of a negro gradually losing his blackness without disease.—"Pompey, a very healthy negro, of about twenty-six years of age, about two years since discovered on his right thigh a small white spot, which, from that to the present time, has been constantly increasing to the size of nearly a half-crown piece; while there have appeared, on other parts of his body, other spots, to the number of twelve, of different sizes, but all constantly and gradually enlarging. In several of the spots the margin is perfectly defined, from a distinct line between the clear white and the natural colour. In others there are circumscribed rings of a dun appearance, the external mar-

gin of which is very regular. I have the fullest belief that a very few years will complete the total change."

This correspondent replies, in answer to the query made in our vol. iv. p. 427, that the venomous saliva there mentioned was a morbid secretion, inasmuch as quicksilver had not been administered to him in any form whatever.

DATURA STRAMONIUM.

The following instance of the efficacy of datura stramonium was communicated by A. J. De Rosset, M. D. of Wilmington (North-Carolina), to Dr. Miller.

"A gentleman, aged thirty-six years, of a very athletic make, who had been in habits of intemperance, with respect to the use of spirituous liquors, for some years, and had, in consequence thereof, been subject to occasional attacks of convulsions, was seized, about the 8th or 9th of May, with a fever, accompanied with frequent bilious vomitings, which so far yielded to the use of the usual remedies, that he was able, though weak, to attend to the affairs of his farm by the 12th. On the 15th of the same month I was requested to visit him, on account of a species of mental derangement, with which he had been attacked the day before. The account given me was, that he had not, during the last fortnight, indulged in any excesses: that, about dinner time, on the 14th, after having slept badly the night before, he often imagined that he saw people coming towards his house, and would frequently mistake one object for another, while, at the same time, he seemed sensible of these perceptions being erroneous: he nevertheless ate a hearty dinner; after which his symptoms increased, and, by evening, were so violent that he stripped himself naked, and ran into the woods, showing every mark of the utmost terror; nor would he suffer any person to approach him. About twelve o'clock, the night being extremely dark, his attendants lost sight of him at the edge of a swamp into which he ran. In the morning he was found, very much bruised and torn by the bushes and briars, and conveyed to his habitation. In this situation I saw him. He spoke incessantly of the persons from whom he thought he had received ill treatment. His eyes were quite suffused with blood; the countenance very pale; pulse small, though not much quickened. With some difficulty he was prevailed on to go to bed. The decoction of the seeds of the *datura stramonium*, prepared as recommended by Dr. King, in the second volume of your Repository, was prescribed, and repeated

every ten or twelve minutes, till he fell asleep, which was when about fourteen drachms had been taken. He slept for several hours, and awaked much refreshed: his mind, however, continued in a small degree deranged, but was quite restored by a continuance of the medicine at longer intervals. He is now in the full enjoyment of all the faculties of his mind.—No other medicine was given."

FURTHER EXPERIMENTS ON THE PUS OF ULCERS, SHOWING IT TO BE FREQUENTLY AN ACIDIFIABLE BASIS; *by Mr. Richard L. Walker, House-Surgeon of the New-York Hospital, addressed to Dr. Mitchill, June 22,* 1801.

"SIR,

"I observe that the experiments on the *acidity* of the pus discharged from foul and ill-conditioned ulcers, made by Messrs. H. C. Kunze and Brouwer, in the New-York Hospital, last November, have been published in London. They are contained in vol. vi. p. 69, 70, of the Medical Review and Magazine; but the account is not near so ample as in the Medical Repository, vol. iv. p. 297, 299. At the end of the account given of these very interesting and instructive experiments, is published a memorandum of some trials made by Mr. Blair and Dr. Ingenhousz, a few years ago, in the Lock-Hospital, on syphilitic matter, with a different result. These gentlemen concluded that the discharges on which they made experiments were of an *alkaline* quality, because the litmus-paper which they applied to the venereal pus *turned of a bluish hue.* (Med. Rep. vol. iv. p. 71.)

"It strikes me there must certainly be some mistake in the recital of these experiments, or in the experiments themselves; for I never heard before that an alkali would turn any delicate vegetable colour *to a blue or bluish.* On the contrary, it commonly changes vegetable blues and purples to a *green,* as acids turn them to a *red.* The natural colour of litmus is bluish; and in the experiments referred to by Mr. Blair, the matter applied having neither an acid nor an alkaline quality, which is often the case, the paper was taken out without having undergone any change of colour at all. The inference, therefore, from their experiments, is simply this, that, in the trials made, the *litmus-paper gave no evidence of acidity.* This is doubtless very true; for it is well known to us here, that pus is not *always* acid, but becomes so only in *certain*

circumstances, and these *connected with an unhealthy aspect of the ulcer*.

" Considering Mr. Blair's experiments as not warranting the conclusion he draws from them, and, when rightly understood, actually confirming, and not contradicting, those published by Mr. Kunze, I had at first meditated to end my observations here; but as further experiments were called for within a few days, I have made further experiments upon some of our surgical patients, and these prove, as plainly as the former, that *pus grows sour* within a few hours after secretion on the surfaces of malignant ulcers, and that this appears in *scrophula* as well as in *lues* and *cancer*.

" In the experiments litmus-paper was employed as the test; and this was very convertible to red, by the action of acetous, sulphuric and other acids. To prevent mistakes, I guarded against the possibility of acidity from lunar caustic, red precipitate, saccharum saturni, corrosive sublimate, and every thing else that occurred to me, and dressed the ulcers with dry lint during the experiments. I satisfied myself, too, that blood was not the cause of the red colour acquired by the litmus.

" My first experiment was on the pus of a venereal ulcer on the hand, of two months continuance. The patient had been three weeks under treatment in the surgeon's ward, and the sore was getting well. Yet a piece of the litmus-paper, put in at ten in the morning, and suffered to remain until half past five in the afternoon, was considerably reddened.

" I next tried an old ill-conditioned ulcer with caries of the tibia. It had been under treatment for a month, and was healing. A piece of paper put upon the fleshy part at ten A. M. and taken out at half past five P. M. was evidently turned red, though a shade more faint than the preceding.

" Then a scrophulous ulcer on the arm was tried, which discharged a great quantity of pus from a sinus. It was of fourteen months duration, and not in a very favourable condition. Paper inserted at ten in the forenoon, and removed at half past five in the afternoon, was changed red, and sensibly deeper than in the last experiment.

" Afterwards a trial was made on a syphilitic ulcer upon a woman's leg, of seven months standing, and growing clean. Litmus paper, put in at half past eight in the morning, and examined at noon, was evidently changed to a red. In all these instances the blue colour of the litmus was restored by dipping the papers in a solution of carbonate of pot-ash.

"A man came into the hospital with a mortified penis, occasioned by venereal virus, first showing itself in the form of a small chancre not larger than the head of a pin, and having spread, within a few days, over a large portion of the prepuce. This ulcer was in a most foul, offensive and gangrenous condition. Litmus paper put into it was changed to a red in three hours and an half, and the colour was brighter than in any of the former experiments.

"In a case of *common* sore-shin, of eight years standing, a paper put into the ulcer, and soaked in its pus for several hours, underwent no change at all.

"The *acidity* of pus, mentioned by EVERARD HOME, may be opposed to the *alkalinity* supposed to be detected in it by ADAIR CRAWFORD.

"Indeed, Sir, the results of these and other experiments were so steady and similar, that I need not trouble you with further details. The pus of certain ulcers appears to me to be an acidifiable basis, and to attract oxygen from the atmosphere. It therefore takes some time to become acid, though this is commonly effected in the course of a few hours. What modification of the septic acid this will turn out to be, I must leave to your consideration. I suppose it must be septic acid, because, when concentrated and plentiful, it corrodes the flesh, stirs up hectic fever in the individual, and, when raised into gas, from numerous ulcerated surfaces (which are so many local sources), by the heat of the living body (96 or 98 Fahrenheit), breeds the infection of jail, ship and hospital fevers, to be communicated to others within its reach.

"It is remarkable how near the truth some great men may come, and not quite reach it. Sir JOHN PRINGLE, I observe, found that an *austere acid* was produced by mingling putrid animal substances with bread and other vegetables. (Paper v.) He was satisfied that the fæces humanæ often contain an *acid*. (Paper vii.) He delivers it as his conviction, that there is a *latent acid in the composition of all animal bodies*. (Exp. 47.) In foul ulcers, and other sores, where the serum is left to stagnate long, the matter, he says, is always acrimonious. And he has proved sufficiently (Paper i.) that putrid substances are not alkaline, and that alkalies are powerful antiseptics. Yet the Baronet could not draw the conclusion from all these discoveries, *that putrid or septic exhalations were acid*, nor *that the pus of foul ulcers was an acid*. But we have done it for him, and shown that these,

like other effluvia from nastiness, are the exciting causes of malignant and pestilential distempers.

"I think it not necessary to say more on the subject: for my own part I stand convinced, and I most sincerely hope the above-mentioned facts will tend to clear up the doubts of the incredulous, and universally to establish your doctrine."

AN ACID IN THE ALIMENTARY CANAL DURING CONFLUENT SMALL-POX.

Dr. Vaughan, in a letter dated Wilmington, May 9, 1801, writes thus to Dr. Mitchill:

"Having met with a case of confluent small-pox, in which the acid nature of the disease was attested, I hasten to inform you of the fact, as it tends to generalize your doctrine of pestilential acidity.

"When the eruption took place in this case, the concomitant symptoms of malignity rendered the use of bark, blisters, &c. essential. The alvine evacuations were black and granulated, resembling dry coffee-grounds, had an acid smell, and excoriated the verge of the anus. These circumstances induced me to test the fæces with alkali; and, when they were put into a solution of pot-ash, an effervescence took place, and the black colour was changed to a brown, and the tenacity of the matter restored. It must be observed that the child's food consisted of mucilaginous substances, as sago, calf's feet jelly, &c. After the fæcal matter had remained some hours in the alkaline solution, I added a little nitrous acid to the mixture, and the *decomposition* restored the black and granulated appearance of the fæces.

"The nature of the contents of the intestines was now ascertained with precision, and I omitted the bark, and gave the carbonate of pot-ash with unremitting attention. The effects of the alkali were soon manifested in the alteration of the discharges, and I am persuaded its beneficial influence was not confined to the alimentary canal. The pock gradually assumed a more favourable aspect, and progressed toward the distinct form of the disease. At the usual period of turning they were full and regular, and, by opening and evacuating the matter, the secondary form was much mitigated.

"From the experience of this case, I shall hereafter have much more reliance on alkalies than on the Peruvian bark, in confluent small-pox; and I have no doubt but the disease may be completely transformed by the early and liberal use of alkalies."

UNDESCRIBED LITTLE QUADRUPED OF GEORGIA.

Josiah Meigs, Esq. President of the University of Georgia, has forwarded to Dr. Mitchill a dried preparation of an American animal, which seems to be a non-descript. The letter which accompanied the specimen is dated Augusta, July 13, 1801, and states that, "for the space of about one hundred miles, between Savannah and Augusta, the land on each side of the road is almost covered by the heaps of loose earth raised by it."—The creature is of the order of the *Glires*. He is a *mus*, and belongs to the division of the *criceti*, or *hamsters;* and is thus described by John Milledge, Esq. Representative in Congress from the State of Georgia.

"One of the little animals that burrows in the pine land, only known in Georgia, was caught by Mr. Stephen Pierce, living midway between Savannah and Augusta. Its body is of the length and thickness of a common-sized rat, and of the same colour: the head between that of a rat and mole, with small whiskers and short snout: the tail without hair, but shorter than that of a rat: the fore feet like those of a mole, with nails near an inch long: the hind feet like those of a rat, but the nails not of the same length, each foot having five claws: very sparkling small eyes: also short ears: teeth like a squirrel, and full as long. On both sides of the jaw, externally, are sacks or wallets, where it deposits its food, and each will contain as much as can be put in a large table-spoon. Little or no fur, and the hair of the length of a wood-rat. The whole face of the pine country is covered with little mounds made by this animal, of the circumference of a peck, and from six to eight inches high. It is by no means active, but remarkably fierce. No common wooden place of confinement can hold it long, as it gnaws its way out. It lives entirely on roots, and is very fond of the sweet potatoe, and often proves injurious to the planter by getting under his stacks. It appears to move nearer the surface in the spring and fall than at any other season. It is surprising, that though the work of this creature is seen throughout the country, in the region of the long-leaf pine, and in that region only, yet such is its skill in burrowing, and acuteness of hearing, that there is no animal in all our State so seldom caught or seen."

This account, which does not wholly correspond with the character of the *Mus Cricetus Germanicus*, leads to the belief of its being a new species. But in order to be quite satisfied of this, it is necessary to be more particularly acquainted with its manners and way of life.

COPAL-VARNISH MADE WITH ETHER.

Mr. Carendeffez, after many experiments on the manner of dissolving copal, has at length discovered that the following process is successful in preparing a varnish from it:—Take an ounce of good *sulphuric* ether (taking care that it is not *sulphureous*, in which case it must be re-distilled from some metallic oxyd, as manganese, minium, or the like), and an ounce of gum copal in gross powder; mix them together in a well-stopped bottle; then place them in a moderate sand-heat or water-bath, and the copal will be completely dissolved. In a letter to Dr. Mitchill on the subject, Mr. Carendeffez observes, that though this is not a very cheap solution of copal, yet the varnish is very fine and brilliant; and the process is so easy as to be repeated by any person, though of very moderate skill.

MALIGNANT FEVER IN IRELAND.

It appears by the following article from Waterford, that a local fever has made its appearance in that place:

"Rev. Sir, *Waterford, June* 18, 1801.

"The visitors of the sick poor waited on me for the purpose of giving it as their opinion, that the greatest cause of the fever which is now so very prevalent in this city arises from the putrefied holes adjoining the houses of those infected with that very great malady, which opinion does perfectly agree with my own sentiments.

"I therefore have to request that you will please to impress, as fully as you can, upon the minds of your congregation, that the very little advantage they can obtain from the small quantity of dung which can be gathered out of those holes, can in no wise compensate for the risk they run, by having such filthy stagnated pools close to their houses, which, in many instances, proved mortal to themselves, and a very great injury to the public in general.

"I am, Rev. Sir, &c. &c.

"Samuel King, *Mayor*."

AN AMERICAN SOLDIER'S RATION.

A ration is to consist of eighteen ounces of bread or flour, or, when neither can be obtained, of one quart of rice, or one and a half pound of sifted or boulted Indian meal—one pound and a quarter of fresh beef, or one pound of salted beef, or three quarters of a pound of salted pork; and, when

fresh meat is issued, salt at the rate of two quarts for every hundred rations; soap at the rate of four pounds, and candles at the rate of a pound and an half, for every hundred rations. The proposals will extend to the supply of rum, whiskey, or other ardent spirits, at the rate of half a gill per ration, and vinegar at the rate of two quarts for every hundred rations. The price of the several component parts of the ration, as well as of substitutes and alternatives, must be specified.

[*Secretary at War's Proposals.*

ON THE DECOMPOSITION OF WATER.

To the Editors of the Medical Repository.

"*Philadelphia, July* 4, 1801.

"GENTLEMEN,

"In August, 1799, I sent you some observations concerning the non-action of the concentrated nitric acid on silver, copper and tin, which were published in the Medical Repository, vol. iii. p. 207, and have since been reprinted in Tilloch's Philosophical Magazine. In the same volume of the Repository, p. 415, the following remark occurs, under the head of *Medical and Philosophical News;* and appears to have been suggested by, and is a denial of, what I advanced on this subject.

'The more nearly the nitric acid approaches to purity, the more powerfully Mr. Carendeffez finds it acted upon by silver, copper and tin, notwithstanding its strength and concentration, provided its water of liquidity be not too much diminished.'

"I have since frequently repeated these experiments, and still adhere to my former opinion, which I consider as just.

"If nitric acid, prepared from the common oil of vitriol and nitre of the shops, can be kept, for weeks or months, over silver, copper and tin, without affecting these metals, and if they are acted upon in a most violent manner *instantly* when water is added to it, certainly we ought to conclude that the acid will not affect them, and that water is necessary to its action.

"The phenomena which accompany the solution of each of these metals, in the acid, are considerably different.

"When the diluted acid is added to tin, a most violent commotion ensues, accompanied with a discharge of common nitrous and dephlogisticated nitrous air, and the formation of the nitrates of tin and ammoniac, and a large quantity of the white oxyd of tin.

"This experiment affords us a strong and elegant proof in favour of the decomposition of water, the corner stone of the new theory of chemistry.

"The hydrogen of the water unites to part of the azote of a portion of the nitric acid, and generates ammoniac, which joins to some of the nitric acid, and makes nitrate of ammoniac. A second part of the azote of the acid lays hold of part of the oxygen of the acid and water, and produces common nitrous air. The remainder of the azote of the acid seizes upon another portion of the oxygen of the water and acid, which gives rise to the dephlogisticated nitrous air. A third part of the oxygen of the acid and water joins to the tin, converts it into a white calx, a little of which is dissolved by a small quantity of the acid, which makes the nitrate of tin.

"If water is not essential to the action of the nitric acid on tin, in what manner is the ammoniac produced, or from whence comes the hydrogen which enters into the composition of this substance? It is necessary to add lime, pot-ash or soda to the solution of tin in nitric acid, to disengage the alkaline gas.

"I have the honour to be, Gentlemen,
"With the highest respect,
"Yours sincerely,
"JAMES WOODHOUSE."

SINGULAR FACTS RELATIVE TO A CASE OF BLINDNESS.

Mr. Peter Foissin, student of Physic at Charleston, South-Carolina, in a letter to the Editors of the Medical Repository, dated 6th May, 1801, has transmitted the following case.

"Philip, a negro man, aged twenty-five years, received a blow with a whip in the right eye, which had the effect of inducing a complete cataract. Either from sympathy, effusion, or the excessive action of the rays of light upon the left eye, it in a short time became affected with amaurosis, to the utter extinction of sight. His other senses are much improved, particularly that of feeling, which is so nice that he can, without hesitation, ascertain when he approaches any body, animate or inanimate, by a peculiar sensation, the acuteness of which is so exquisite as to enable him to say with precision what part of his body is approximated to the object. Whether this *sensation* is the effect of attraction, or the obstructed passage of air, I declare myself incompetent to decide; how-

ever, I rather suppose it to be the effect of attraction, from the description he has given of the sense. His venereal appetite, which, prior to his blindness, was moderate, is now so much increased, that three women, with whom he is now connected, are scarcely sufficient to satiate his inordinate desire for the exercise of this function.—His head is an almost perfect directory. He goes to market, or any other part of the city, without difficulty, and with surprising expedition; and such is the wonderful effect that habit has wrought upon him, that he declares, was he restored to sight, it would be impossible for him to pursue immediately his daily avocations with as much precision and facility as he does at present."

DISCOVERY OF VACCINE POX AMONG AMERICAN COWS.

We are happy to find that our suggestion to physicians in the United States, to inquire for the vaccine disease among the cows of this country (see our vol. iv. p. 322), has produced the desired effect. The coincidence of the following articles of information, derived from different respectable sources, and, so far as we know, without communication with one another, seems to place the fact beyond the reach of doubt. We state them as they severally came to our hands.

Dr. William Buel, of Sheffield, in the State of Massachusetts, in a letter to Dr. Miller, dated 20th May, 1801, describes the case of a lad, in his neighbourhood, affected with an eruption on the face and hands, greatly resembling vaccine pustules, to whom he was called on the 10th of the preceding month. With matter taken from these pustules he inoculated several persons, and observed the disease to pursue a similar course, and to exhibit similar phenomena, to a case of actual vaccine pox then under his care. And after the termination of this new disease, he tested it, as usual, by variolous inoculation, with the same happy result as in other cases of vaccine pox. Upon inquiry he found the lad had sometimes milked cows, that these cows had been observed to have sore teats, and that the hands and face of the lad had been prepared for the reception of the disease by having been previously scratched in play with his companions.

Dr. Elisha North, of Goshen, in the State of Connecticut, who has bestowed much attention on the vaccine disease, has found it among the cows of that neighbourhood, and inoculated it with success. In a letter of the 25th of May last, to Dr. Miller, he announces the discovery, and that the inoculation

of the disease had then been tried, in a number of instances, with complete effect.

Dr. Joseph Trowbridge, of Danbury, in the State of Connecticut, in a letter to Dr. Mitchill, dated 6th of July, 1801, communicates a similar discovery which he has made among the cows of that place. At that time he had inoculated three persons of his own family, and the disease produced by the inoculation exhibited all the appearances of the genuine vaccine pox.

Since our last number, the vaccine disease, apparently genuine, has been introduced and propagated in this city. The present season of the year, which, according to popular prejudice, is deemed unfavourable to inoculation, has hitherto prevented the disease from being employed frequently or generally; and the usual banishment of the small-pox at this time, renders it more difficult to apply it as a test of the genuineness of the few cases of vaccine pox which have yet occurred. We hope to be able to offer a more satisfactory account of the progress of the disease in our next number.

SUBSTITUTE FOR COLUMBO.

The stem and root of the plant, called, by L'Heretier, xanthoriza simplicissima, or apiifolia, has been found, by Professor Woodhouse, to afford a beautiful yellow dye. It is a native of the Carolinas; and the specimens sent us have a bitter, aromatic, and somewhat mucilaginous taste. Dr. Woodhouse affirms that they possess medicinal powers not materially unlike those of columbo-root. This plant may, therefore, be considered a valuable addition to the American Materia Medica.

MEDICAL SCHOOL AT NEW-YORK.

The Medical Lectures in Columbia College begin annually on the second Monday of November; and the arrangement of the courses continues to be as follows:

Natural History and Chemistry by Professor S. L. Mitchill.
Anatomy and Surgery by Wright Post, Esq.
Midwifery and Clinical Medicine by J. R. B. Rodgers, M. D.
Botany and Materia Medica by David Hosack, M. D.
Theory and Practice of Physic by William Hamersley, M. D.

FOREIGN.

OXALIC ACID FROM SCROPHULOUS GLANDS.

IN Hufeland's Journal the following fact is mentioned, which may deserve the attention of our medical readers. An anatomical preparation of indurated glands, from a very scrophulous subject, having been put into spirit of wine, it was found, some time after, to be incrusted with saline crystals. To prove that they really came from the preparation, and not from the spirit, other spirit was added, of known purity, but with the same effect. By chemical analysis, the crystals were found to be the oxalic acid. This circumstance may support the opinion of an acid change of the humours in this disease, and may suggest an explanation of the benefit derived from absorbent earths and alkalies.

[*Lond. Month. Mag. May*, 1801.

ON THE MEDICAL USE OF PHOSPHORUS.

Phosphorus, whose use was introduced into medicine about fifty years ago, is known as the most powerful exciting remedy which we possess. Several physicians have tried it, with more or less success, in all cases where a high degree of nervous debility prevails; and accordingly, in nervous fevers, palsies, impotentia virilis, epilepsies, &c. also in arthritis nodosa et atonica, it has proved very efficacious; and it likewise deserves to be used in cases of persons poisoned with lead or arsenic. There exists, at least, an instance of a person, who, having been given poison in Italy (probably aqua toffana), became quite emaciated, his nails and hair fell off spontaneously, and his life was only saved by phosphorus. Its effects are, at the same time, in a considerable degree diuretic and diaphoretic.

Experience has, however, shown that the application of this remedy requires the utmost caution; and it may sometimes prove very dangerous, if proper care is not taken, as it has been observed either to cause a vehement inflammation in the stomach and bowels, accompanied with very burning pains in the regio hypochondriaca, and often terminating in death, or by producing indurations, or scirrhus of the stomach, which occasion chronic cardialgies, indigestions, an habitual vomition of whatever is taken, emaciation, and hectic death. These ill consequences are, in a great measure, owing to the mode in which it is administered, either by giving it in substance or in

too great a dose, as, in the first case particularly, the minutest particle of it may, by adhering to the stomach, produce an inflammation, or at least an induration.

As for the dose, it has been observed that it never must exceed two grains in 24 hours, and a burning pain or sensation was always perceived whenever it was given in a greater quantity; but generally one grain in 24 hours will be sufficient to produce the desired effects.

The form in which it is to be exhibited ought to possess the quality of containing the phosphorus quite dissolved, and, at the same time, of obtunding its too dangerous irritation upon the stomach. The forms hitherto used were a mixture with a conserve, which is of all others the most improper, because the remedy is applied here in substance, and may, of course, easily bring on the above mentioned symptoms; a solution of it in oil, which, though otherwise very proper, is too disagreeable to take; a solution in ether, or naphtha vitrioli, in which the phosphorus entirely dissolves; but by this combination, its heating and irritating qualities are exceedingly increased; and as only eight grains of phosphorus are soluble in one ounce of the ether, 120 drops must be taken only to bring one grain of it into the body, which in most cases would be too dangerous. However, this naphtha phosphorata may be of great benefit or use in a very high degree of nervous debility, combined with a total want of sensation.

The following form of giving phosphorus internally will therefore be the most proper, on account of containing it dissolved and equally divided throughout, and having it sufficiently involved in mucilage to prevent any ill consequences from a local irritation of the stomach, even in very sensible constitutions. The phosphorus is rubbed with sweet almonds, or a sufficient quantity of gum arabic, to make an emulsion, and, by an addition of spiritus nitri dulcis, or liquor anodynus, the taste and smell of the phosphorus is rendered less disagreeable.

℞. *Phosphor. urinæ gr. ii. subigatur longa triturationc cum mucilagine gum. arabici q. s. ut fiat cum aquæ fontan unc. vj. emulsio, cui adde syrup. althaeæ unc. j. liquor. anodyn. miner. Hoffmann. gutt. xxx.* D. S. *omni bihorio cochlear. sumendum aut plus. pro re nata.* In this way a very efficacious solution will be obtained, which shines in the dark, and is agreeable enough to be taken. *(From Hufeland's Practical Journal, vol.* vii. *No.* 3. 1799).

APPENDIX.

ARTICLE I.

[*The late Dr.* JACOB OGDEN's *method of treating the Malignant Sore Throat Distemper has been frequently mentioned among Practitioners of Medicine: but the original pieces published by that gentleman have become very scarce. Having been fortunate enough to find them in two pamphlets printed about twenty-five years ago, we have thought them worthy of republication. And we offer them in the form in which they first appeared, which is that of letters addressed to Mr.* HUGH GAINE, *of New-York.*]

LETTER I.

Jamaica (Long-Island), Oct. 28, 1769.

SIR,

BEING moved with compassion for the distressed condition of the people in Boston and Oxford, occasioned by the fatal effects of the malignant sore throat distemper, I take the liberty to offer to the consideration of those gentlemen of the medical profession who may not be well acquainted with the disorder, the following method of cure, which, by the blessing of God, I have had the most happy experience of for near twenty years past; but being confined within the common limits of an Almanack, shall be as concise as the nature of the case will admit of; referring the reader, for the definition and diagnostic symptoms, to the several treatises wrote by Drs. Fothergill, Huxham, and Douglass; and shall only deliver briefly my method of cure.

Alexipharmic and sudorific medicines have long and deservedly been in great esteem as the basis of a radical cure of this disease; and, by writers upon the subject, have been universally recommended, particularly by the above-mentioned gentlemen, whose labours deserve the highest commendations. But too often were those means found inadequate to the malignancy of the disorder, as well as many other remedies represented as real specifics. Without doubt it has been observed, with grief, by others as well as myself, that, notwithstanding the seasonable and plentiful use of those reputed specifics, the distemper

generally proved fatal: Wherefore, in a time of great mortality, about twenty years ago, in and near this town, I tried the effects of mercury, joined with alexipharmics and astringents, by adding a considerable dose of *mercurius dulcis* to the *Edinburgh* or *Venice* treacle, which succeeded even beyond my expectations; but those treacles not fully answering my end, I substituted the following, which I have, without much variation, continued in the use of to this time.

"Take of the powders of seneka rattle-snake-root two ounces; of contrayerva roots one ounce and a half; of Virginian snake-roots, the roots of aromatic calamus and wild valerian, the tops of rue, and the flowers of English camomile, each one ounce; of cinnamon myrrh, resin of guaiacum, British saffron, balsam capivi, prepared crabs eyes, and *Armenian* bole, each half an ounce; of ginger and opium each two drachms; of *Madeira* wine enough to dissolve the opium; and of clarified honey thrice the weight of all the powders."

Neither time nor room permit me to make any further remarks upon the above treacle, than that I have abridged the quantity of opium ordered in the others (which I found too predominate in most cases, especially when given to children), and added the seneka rattle-snake-roots, perhaps the most powerful *antiseptic* vegetable in the whole *Materia Medica*, manifested, to mention no more, by its almost immediate cure of the bite of the rattle-snake.

The doses which I have generally given, and would recommend, are, to a child of a year old, fifteen grains of the above treacle, and two or three grains of the *mercurius dulcis:* to one of six or eight years old, half a drachm, or two scruples of the treacle, and four or five grains of the mercury: to a grown person, a drachm and a half, or two drachms of the treacle, and six or eight grains of the mercury, repeated every twelve, sixteen, twenty, or twenty-four hours, as the urgency of the symptoms may indicate. And in case the symptoms are very threatening, or the patient should have been ill several days, without proper means having been administered, an intermediate pill of the mercury may be given occasionally; thus continuing until the sloughs are entirely separated from the tonsils, &c. drinking strong sage tea, acidulated with vinegar, for common drink, observing to keep the patient warm, by avoiding the cold air, drink, &c. not only until the disorder seems to be entirely subdued, but a considerable time after, lest a sudden, and often a fatal, relapse should succeed. The mercury seldom purges after the first or second

dose. If a bolus should be disagreeable to the patient, the treacle may be dissolved in wine and water, or sage tea, and the mercury be given in a pill.

The above medicines will generally remove the disorder in two or three days, if given in the beginning. Often two or three doses prove sufficient; but when the symptoms are obstinate, I recommend the use of the boluses until the venom of the distemper appears to be entirely extinguished. I have more than once proceeded to the twelfth dose, besides four or five pills of mercury *per se*, containing four or five grains each. To a girl nine years of age I gave sixty-two grains of mercury, in conjunction with the treacle, in about twelve or fourteen days. She happily recovered, although she had the *hoarse cough* several days during her illness.

When *exanthemata* or eruptions appear, the doses may be diminished, but repeated at least twice in twenty-four hours.

Ulcers behind the ears, in the groin, or in any other part, discharging a thin corroding ichor, I advise by no means to be suppressed, especially by red precipitate, or any other topical application that has a power of constipating the efflux; for it is almost certain that a retrocession of the *virus* will speedily have fatal effects. But cataplasms of onions boiled in milk, thickened with the crumb of wheat bread, adding a few grains of *British* saffron, may be applied with benefit, and renewed three or four times a day, until the acrimony of the juices is corrected by internal medicines, and the ulcer will, in time, cicatrize spontaneously.

When the solids are uncommonly relaxed, and a seeming dissolution of the fluids, attended with thin, watery sweats or hæmorrhages, I recommend the plentiful use of the Peruvian bark, with the spirit or elixir of vitriol. The bark will also prove very beneficial where the fever intermits; but when the fever is continual, runs high, and the pulse full, especially if attended with a difficult or laborious respiration, I never find any advantage gained by the bark.

I am not unacquainted with the surmises of some, that since the known *genius* of the disorder dissolves the *crasis* or texture of the blood, so as often to cause fatal hæmorrhages, such quantities of an active mercurial preparation as I have recommended would increase the danger. But long experience has taught me the contrary; for the sooner the dissolving acrimony in the blood is mitigated, the less may the danger of hæmorrhages be apprehended.

Notwithstanding the incredible quantity of mercury a person may take in this disorder, when obstinate, without any apparent indications of a ptyalism, more than what is commonly a concomitant symptom of the disease itself, yet, when the case has been rather favourable, the effects of the mercury will sometimes appear, by causing the gums, especially of the *molares*, to tumify, attended with a white or yellowish slough on the inside of the cheek; the * cheeks and *fauces* being also tumified externally. However, these effects always prognosticate a favourable issue; therefore I never suppress the activity of the mercury suddenly, but check it by the most gentle means—such as the flowers of sulphur in small doses with manna, but recommend no other purgatives.

When the fever runs high I generally give less of the treacle, or neglect it wholly, and give a pill of mercury every evening and morning till the fever is moderated; then the treacle may be given as above directed. I have frequently known two or three pills in the beginning, with the assistance of no other medicine but sage tea, or an infusion of the contrayerva, to give entire relief.

I have now finished what I conceived necessary to write upon this subject; but if any gentleman of the medical profession desires any further explications relative thereto, I shall always be ready to give him all the satisfaction in my power. And if the communicating to the public my method of practice, in the cure of this terrible and truly pestilential distemper, should be the means of saving the lives of any of my fellow creatures, of relieving the pungent distresses of tender parents, anxious for the lives of their dear offspring, my end will be answered, and a compensation made infinitely more than adequate to the little pains I have taken. All the reward I ask, is, in case the method of cure above recommended should be blessed with the same success in Boston, Oxford, or in any other places, as it has been when prosecuted by myself, that I may have the pleasure of being informed of it by a few lines from some grateful and benevolent gentleman, directed to the public's humble servant,

JACOB OGDEN.

* I have been the more particular here, lest those not much conversant with the disorder might mistake the effects of the medicine for the disease.

LETTER II.

Jamaica (Long-Island), Sept. 14, 1774.

SIR,

AGREEABLE to your request, I have, in the following lines, noted the principal symptoms of the malignant sore throat, that parents and others who have the care of children may know when to apply for relief; being more necessary in this than in most other diseases; since the latent malignity has too often been unsuspected before the last and generally fatal symptom, the *hoarse cough*, has alarmed the family.

The first are commonly heaviness, restlessness, weakness, sometimes feverishness, watery eyes, giddiness, a more than common discharge of a watery saliva or spittle from the mouth, and a thin limpid matter from the nose. All these symptoms are not always conspicuous in every patient; in some so slight as not to be noticed by the family in children, nor scarcely by the adult patient himself. Soon after, and sometimes coeval with the above symptoms, an inflammation with a soreness is observed in the throat; a relaxation of the palate, which will appear much longer and thicker than common; a difficulty of swallowing; a swelling of one or both tonsils, commonly called the almonds of the ears; after which a small white speck or slough will appear on one or both tonsils, resembling cream or a piece of white fustian. Sometimes three, four, or more specks will be on one side, but soon unite. In most the breath has a disagreeable smell; and if the patient had not before, he now begins to have a fever, generally attended with a low quick pulse; the sloughs increase until the whole tonsils, the space between them, behind and under the palate, and sometimes the nostrils, are covered. Soon after, a cough seizes the patient, which, although at first little different from the common, in a few hours becomes remarkably hallow and hoarse; and the countenance appears bloated, with a bluish or livid colour about the mouth—too frequently a mortal presage. These are the common symptoms; but the most certain criterion is the slough in the throat; unless when it begins behind the ears, in the groins, or in some other part previously sore. Wherefore it is highly expedient, that those who have the care of children should frequently examine their throats when this disease is epidemical or suspected, that relief may be applied for in season.

It has been observed, "that weakly persons are more sub-

ject to this disorder than the strong and healthy; women more than men; girls more than boys, and of these the most tender and delicate."

Sometimes, especially near the equinoxes, the disease is attended with eruptions, commonly called a *rash.* In this species, the symptoms, previous to the eruptions, are generally more violent, often attended with a burning fever, great anxiety, a diarrhœa or flux, delirium, &c. until the eruptions are fully out. This is not so dangerous as the former, especially if the efflorescence or eruptions appear before the third day.

I take this opportunity to answer the purport of sundry letters on this subject, which, by reason of a multiplicity of business, I could not comply with before; and shall add some necessary remarks omitted in my former method of cure.

Where a greater flux of saliva than common, or a sharp irritating *ichor* discharges from the mouth and nares—a too sudden or premature retrocession of the eruptions, and when they are partial, or advance slowly, blisters are beneficial. But where the fever runs high, attended with a dry skin, a putridity in the blood, or hæmorrhages, they will be detrimental.

Although drastic purges are ever prejudicial, the body, if costive, should be kept open, and by clysters rather than laxatives.

A symptomatic diarrhœa should be checked with the greatest caution.

In the eruptive species, previous to and during the eruptions, if the fever and other symptoms are violent, diluents taken plentifully, instead of the alexipharmics heretofore recommended, will generally be of more benefit, until the fever is abated; after which the warmer medicines may be given until the sloughs are removed, as formerly directed. In most patients the sloughs disappear upon the subsiding of the eruptions, except when repelled by a diarrhœa, an improper use of purgatives, by cold, or too much heat.

When the *hoarse cough* has seized the patient, it will be necessary to increase the mercury to near double the quantity formerly ordered, e. g. instead of five grains evening and morning, four grains may be given every six hours, in conjunction with the most powerful antiseptics and sudorifics. A child of six years of age took, in the space of twelve or fourteen days, upwards of a hundred grains of *mercurius dulcis*, in this stage of the disease, with the most happy success. Oxymel of squills, often repeated, in small doses, rather as an

expectorant than emetic, when respiration is much impeded, will sometimes give great relief. Anodynes, in this last stage, should be given with great caution, if given at all.

Detergent gargarisms or injections are of service when the patient is of an age capable of using them. The air of the room where the sick lie might also, with advantage, be continually impregnated with the steam of vinegar. Sea-coal might be burnt in the winter instead of other fuel; and, in the summer, the room might be fumigated with myrrh, rosin and sulphur, strewed on burning coals, often in a day. These fumes, if diligently persisted in, would, it is more than probable, not only much benefit the sick, but be the best means of preventing the infection from spreading in the family.

Notwithstanding, after taking large quantities of mercury, no effects of it are visible after the patient's recovery. It will be absolutely necessary to order a dose of flowers of sulphur, once or twice a day, several days, lest some unfavourable accident should ensue.

J. OGDEN.

ARTICLE II.

Some Account of the PESTILENTIAL FEVER *which lately prevailed at Cadiz, in Spain.*

IN our vol. iv. p. 320, we gave the best account of this disease in Spain then in our power, with a promise of further details on some future occasion, which we now are happy to perform.

We are enabled to present to our readers some authentic information on this subject, by the kindness of John Morton, Esq. Consul for the United States at the Havannah, whose zeal for the public service induced him to put into our hands a "Supplement to the Madrid Gazette," dated Tuesday, 28th October, 1800. In this newspaper we find an account of that malignant disease under the following title:

"*A description of the epidemic disease which began in the city of Cadiz—its origin and propagation—the different symptoms and effects of it—and the method of cure adopted, according to the observations and experience suggested at repeated meetings and consultations of the physicians in that*

city; published by order of the government, for the instruction of the public, and particularly for the notice and regulation of the practitioners of medicine and surgery, to the end, that whenever, hereafter, they discover such symptoms or indications among the sick committed to their charge, they may immediately make the communication to the magistracy or board of health, for the purpose of separating such sick persons from the community, subjecting them to quarantine, and preventing the spread of contagion."

Our limits allow us only to offer an abstract of most parts of this curious paper. After introductory and general remarks, the writer distributes the contents of the paper under the following heads: History of the Disease—Symptoms—Prognosis—Method of Treatment—Conclusion.

In the *history of the disease*, notice is taken of the usual healthfulness of Cadiz, of its former opulence from the extent of its trade, of the injuries and inconveniences suffered by the present war, and of the depression of mind which the inhabitants have experienced in consequence of their distresses. The winter preceding this epidemic had been long and wet; the rainy season had been prolonged till the month of May; the summer was intensely hot, insomuch that, from the middle of July, Fahrenheit's thermometer rose to 85 degrees; an easterly wind succeeding, lasted for the space of forty days, which being a very hot wind in that country, subjected the inhabitants to extreme heat, and affected them with sweatings so profuse that they could enjoy no comfort but in bathing; at the beginning of August no diseases appeared except some inflammatory ones, such as quinsies, ardent fevers, &c.—About the 8th of the same month many bilious fevers began to appear, but they were of short duration, and yielded, in plethoric habits, to a slight bleeding, and to the usual subacid and cooling treatment. After the tenth and fifteenth of August, many people, in the quarter of Santa Maria, and in the eastern parts of the city, were observed to be attacked with what appeared to be a low nervous fever, attended with great prostration of strength, and other characteristic symptoms of malignity. And soon afterwards the disease was propagated to the other parts of the city: the physicians called the attention of the magistracy to the object: consultations were held, and means adopted to prevent the further spreading of the mischief.

Symptoms.—This disease came on with chilliness, pains in the head, particularly in the temples and orbits of the eyes—

pain in the back, frequency of pulse, burning heat of the skin, bilious vomitings, bilious stools, foul tongue, great prostration of strength, and uneasiness of the upper orifice of the stomach. More or fewer of these symptoms appeared in all cases of the disease, whether mild or malignant. In the more malignant forms of the disease, the following symptoms supervened: starting of the tendons, alienation of mind, hiccough, convulsions, bleeding from the nose, vomiting of blood, bloody and dark-coloured stools, yellow skin, petechiæ, and, finally, black-vomiting, similar to that which is endemic, at certain seasons of the year, at Vera Cruz, Honduras, &c.* The most fatal appearances were coldness of the extremities, feebleness of the eye-lids, vomiting of matter like coffee-grounds, hiccough, convulsions and coma. Many who had yellowness of the skin and petechiæ, bleedings from the nose and anus, happily recovered, if vomiting and hiccough did not supervene.

Prognosis.—In cases where the fever went off about the third day, without any appearances of vomiting, favourable expectations might be indulged; but when exacerbations returned on the fourth or fifth day, accompanied with the above-mentioned symptoms, and especially where prostration of strength and coldness of the extremities also took place, a fatal termination might be expected.

Method of treatment.—As soon as the epidemic appeared, the magistracy, with the advice of the physicians, employed every practicable measure to purify the atmosphere. Privies were cleansed; the dead were ordered to be buried out of the city; it was enjoined upon house-keepers to preserve cleanliness in every respect, and to ventilate their apartments; smoke of green pine was dispersed through the streets and lanes; houses were sprinkled with vinegar and aromatic herbs, and filled with the vapours of them; gunpowder was flashed in different places; and many other means were tried for the same purpose.

Persons seized with the disease were treated with mild diaphoretics, nitrous preparations, cream of tartar, neutral salts, vegetable acids, injections, and cataplasms to the feet. If by

* In order more completely to satisfy our readers of the exactness of our translation, we here subjoin the words of the original: "——los subsultos tendinosos, la enagenacion de mente, el singulto, los movimientos convulsivos, la hemorragia de narices, la vomicion sanguinolenta por la boca, la melena, deyecciones de sangre, la ictericia, las petechias, y ultimamente el vomito atrabiliario, á que han querido llamar *vomito prieto, semejante al que es endemico en ciertas estaciones del ano en Vera Cruz, Honduras, &c.*"

such slight remedies perspiration was excited, and the bowels moved, the fever was sometimes favourably terminated on the third day; after which some gentle cathartic, such as tamarinds, manna or Glauber's salt, followed by the Peruvian bark in tincture for a few days, often completed the cure. This was the treatment of the milder cases. In cases of greater violence, antimonial emetics were ordered, and soon afterwards the Peruvian bark in substance, opiates, dulcified spirits of nitre, injections composed of tamarinds in a decoction of bark, &c. When vomiting supervened, so as to prevent the reception of the bark, it was given in clyster with antimonial wine, &c. To allay vomiting and hiccough, an oleo-saccharum, with camphor, was given in large doses; and especially to relieve the hiccough, the same oleo-saccharum, with the addition of lemon-juice, was found very useful. Such as were affected with vomiting of blood, bleeding from the nose, or melæna, took the vitriolic acid, properly diluted, and often repeated. In cases of coma, caustics were applied to the legs and to the back of the neck. In a word, the remedies chiefly relied upon were mild emetics and the Peruvian bark; the former of which, it is mentioned, sometimes operated to an injurious excess, in cases of great irritability, so as to require gentle eccoprotics to be substituted—and the latter, in substance, sometimes produced such violent colic pains that it became necessary to use the tincture instead of the powder, aided by ether, opium, or the anodyne liquor of Hoffman.

The opinions of the physicians of Cadiz, concerning the origin, nature and causes of this malignant disease, are next presented, as the conclusion of the paper, in the form of distinct propositions; and as they constitute the most curious part of the publication, we offer it to our readers, as far as possible, in their own words.

"Proposition 1st.—Miasmata and contagion, like cold, lessen the energy of the nervous system; hence they operate more powerfully when the sensorium is in a state of debility; but in proportion to the vigour of the system is their noxious influence counteracted. The constitution of most of our inhabitants, debilitated by constant mental depression, and, in some instances, by dissipation, demonstrated the truth of this position.

"Prop. 2d.—Different states of the system predispose men to the action of contagion, which, being of a septic quality, operates like a ferment, inclines the fluids to a putrid fermentation, and creates a predisposition which makes men more sub-

ject to epidemic diseases; hence such diseases are most prevalent in hospitals, ships, jails, &c.

" Prop. 3d.—Habit, or assimilation to climate, may destroy the effects of contagion; hence the typhus icteroides, or the yellow fever of the West-Indies, so mortal to Europeans, seldom attacks the natives. This fact leads to an important, but doubtful discussion. Our malignant disease having invaded a single family in a quarter of the city chiefly frequented by privateersmen and seamen, both foreigners and natives, and thence spreading among all such as had intercourse with them, and proceeding from the inhabitants of the above-mentioned to the other quarters of the city, the opinion seemed to be countenanced, that the exciting cause of this epidemic, originating as above stated, was communicated by contagion. Positive data are wanting to decide this question. But if this opinion may be controverted by the specious objection, that, in other instances, persons just recovering from the yellow fever of Philadelphia or Carolina, have arrived here without any such destructive consequences; still it might be conceived that the absence of those causes which predispose to the disease would sufficiently account for the inactivity of the contagion.

" It has been remarked by a sagacious observer, that the heat and constitution of the air through the late summer in Cadiz were similar to such as are annually experienced in the West-Indies. This confirms our doctrine, and is proved by the fact, that persons lately arrived from those islands, owing to their being accustomed to like seasons, did not suffer an attack of our epidemic; and also by the remarkable exemption of those who have been long resident in this country, as well as, on the other hand, by the liableness of persons from Canada and some other countries to the disease.

" Prop. 4.—Diseases which attack many different persons at the same time, can only originate from causes common to all; such as air and aliments. In like manner, scanty diet, famine, and rainy seasons, as well as bad food, frequently produce idemics more fatal among the poor than among the rich. This cannot be said of the present epidemic, since, *cæteris paribus*, it has been equally mortal to both classes. The qualities of the air likewise demand attention: the sensible qualities are heat, cold, moisture, and dryness; the insensible qualities are such as arise from substances dissolved in the air, and which remain suspended in the form of vapours. These vapours are capable of producing the same effects in various subjects. They are generally known under the appellation of mi-

asmata and contagion, and constitute the efficient cause of the disease, modified, or, more properly, augmented in force, by the diversity of the sensible qualities of heat and moisture, which increase the tendency to putrefaction.

"Prop. 5.—Writers of the first celebrity admit the existence of a common contagion, which consists either of marshy vapours or of human effluvia. The action of these causes may be augmented by several circumstances; either by increasing the acrimony of the bile, and thereby producing cholera and contagious dysenteries, or by disposing the fluids to putrescency. Hence putrescency, petechiæ, yellowness of the skin, or the various species of typhus, mild or malignant, petechial or icteroid—at one time directly attacking the vital principle, and producing synochus, the second species of slow, nervous fever—at another time becoming suddenly malignant, as was the case in many fatal instances of our epidemic, from the direct impression of carbonic acid gas volatilizing the blood, like a stroke of lightning destroying at once the principle of life, and arresting motion and sensation in the origin of the nerves.

"Prop. 6th.—Dr. Piquer has always carefully observed the passions of the mind, as powerful causes of fever, in the same manner as we have attended to the effects of air as well as of aliment. It cannot be denied that violent passions may have this operation; they assail the nervous system with dreadful rapidity, though doubts may arise whether their power is more exerted in the brain or heart. Hence the want of vigour from this cause, augmented by the operation of contagion still more sedative, brings on sudden death; as is unfortunately too often verified in the countries where pestilential diseases prevail. Happily we have not experienced such direful effects, since in none of our patients have pestilential buboes, carbuncles, or anthraces been observed. Though some have been affected with phlegmonous tumours of gangrenous termination, others with erysipelatous vesications of a similar tendency, and others again with parotids; yet they have not been of that class which belongs to the true plague, such as are described by Chicoineau, of Marseilles, and Schemoeluwitz, of Moscow.

"Prop. 7th.—Concluding from what has been above stated, that a damp and warm constisution of the atmosphere, of long continuance, followed by a high degree of heat, have been the most universal causes of our epidemic, which, by exalting and rendering more virulent the insensible qualities of the air, assailed the nervous system, already debilitated by the influence of passions of the mind acting as predisposing causes;

it is not to be wondered at, considering the symptoms above described, that our disease should obtain the character of a putrid and malignant epidemic fever; nor is it strange that, if at first some of these cases assumed the appearances of synochus, they quickly degenerated into putrid and nervous fevers, propagating themselves from one another, and becoming contagious, in some by means of the original cause which produced them, in others by the effluvia of the sick; that they operated with most force upon such as were found already debilitated, or upon those who, though constitutionally robust, were overwhelmed with terror and dismay, and that in such cases they became suddenly malignant, and produced the greatest degree of havock.

"Finally, taking for granted the putrescency of the mass of blood, the acrimony of the bile, the attack upon the nervous system, and the inirritability of the living solid, it might have been expected that the following symptoms would ensue: those of putrescency, such as bleeding from the nose, vomiting of blood, dark coloured stools, petechiæ, colliquative sweats, serous diarrhœas—those of bilious acrimony, such as porraceous and black vomiting, stools of the same appearance, yellowness of the skin—and those of a virulent attack upon the nervous system, such as anxiety and heat about the præcordia, prostration of strength, delirium, convulsions, hiccough, coma, and lethargy. Under such circumstances, the practice adopted by most of the physicians in this city appears to be proper. This treatment, which was varied according to circumstances, consisted in the use of mild diaphoretics at the beginning, or of cooling subacid remedies in the period of reaction; and, in the more violent cases, it consisted of gentle emetics, and especially in the use of Peruvian bark, to resist putrefaction and to strengthen the solids, and likewise in the use of oily and sedative remedies, such as ether in cardialgia and hiccough, and of stimulants and caustics in the state of coma and insensibility.

"Experience has ascertained that these remedies are the most to be depended upon, and that they have been attended with the best success. By the use of them many have been recovered from the borders of the grave. A regard to truth compels us to confess, and in this the other physicians in the city will agree with us, that in this epidemic (differing from any which have been seen in Europe, Asia, or America), the mortality has not been equal to the malignity. The liberal and candid inhabitants of Cadiz will also acknowledge, that al-

though their fellow-citizens have been visited by a dreadful epidemic, they have not observed in the consultations of the physicians that opposition of opinions, and that adherence to system, which is so common in other countries. They reciprocally communicated their observations, availed themselves of foreign as well as domestic experience, preserved uniformity in the method of cure, and, assisted by the zeal and energy of a Magistracy always active and vigilant, they sacrificed their ease, safety and life, as it was their duty to do, to the relief of suffering humanity. We have now the heartfelt satisfaction of seeing the epidemic nearly extinguished, the inhabitants tranquil, and breathing gratitude towards those who had devoted themselves to the preservation of their lives and the re-establishment of their health. This is the sole and the most satisfactory reward that he can seek who exposes his life for the public good, next to the inexpressible pleasure which springs from the restoration of the health of his fellow creatures, and the having been able to contribute, in part, to the discharge of that duty to his country which is imposed by nature."

Notwithstanding the want of accuracy and comprehensive views which pervades this summary of the opinions of the Physicians at Cadiz, we are enabled clearly to deduce from it some inferences, which appear to our minds to convey instruction and appropriate correction as to certain doctrines which have been held and propagated by many of the good people of the United States.

1. We learn that this Spanish disease was precisely such an one as we have lately so often experienced in different parts of our own country. A glance at the description and symptoms will remove every doubt.

2. The history of the epidemic and preceding seasons, the nature of the diseases which went before, the condition of persons who escaped, as well as of those who were most liable to this pestilence, and many other circumstances which might be mentioned, all serve to establish the local, domestic origin of the disease in question, and to prove that similar causes will every where produce similar effects. It is evident, likewise, that the physicians of Cadiz themselves incline to this opinion.

3. We find that the rumour of the derivation of this disease from the coast of Africa, and of its assuming the appearances of the plague of the Levant, which was for some time gene-

rally believed in Europe and America, is unsupported by this publication.

4. It appears that the physicians and inhabitants of Cadiz, like other Europeans similarly circumstanced, have no apprehensions of importing the yellow fever from the colonies of Spain in the West-Indies, and in North and South America, notwithstanding all the commercial intercourse which that city maintains, and has long maintained, with those sickly regions.

5. It results from the evidence of this paper, that all the fears entertained at Cadiz, and other ports of Spain, of receiving the contagion of the yellow fever from the United States, and, of consequence, that all the oppressive and injurious regulations of quarantine, imposed on the trade of our fellow-citizens, are the offspring of the notion of the importation and exportation of that disease, so warmly cherished in Philadelphia, and by a few persons elsewhere.

6. We learn from the contents of this paper, from the events which produced it, and from the public opinion of these events, the importance of forming a just estimate of quarantine, and the mode of conducting it, whether we consider it in a medical, commercial, or governmental point of view. Quarantine, stripped of the mystery and fooleries which superstition throws around it, is merely a system of cleanliness, as to vessels, crews and cargoes, enforced by law. We assert that if a vessel and crew be clean, in the popular and common sense of the word, and the cargo in a state of preservation, such vessel cannot be sickly, with respect to those diseases which it is the object of quarantine to exclude. It was by attending to this point that Capt. Cook was enabled to circumnavigate the globe without the appearance of fever or infection in his crew.

But it may, perhaps, be demanded, how is this cleanliness to be maintained? We answer (as we have repeatedly attempted to inculcate heretofore), by the means which universal experience approves, to wit, ventilation, ablution with soap and alkalies, and white-washing with lime. To these means we constantly owe the preservation of ourselves and families from the terrors and ravages of infection. If infection float in the air of our rooms, ventilation will dilute and disperse it; if it adhere to the floors, walls, cielings or furniture, water, with the aid of soap and ley, will wash it away; and, by white-washing with lime, a clean and fresh surface will cover the walls and ceilings. We are warranted, by positive facts,

to believe that all oily or mucilaginous matters, all animal or vegetable offals, adhering to floors, walls or furniture, in which infection may lodge, can be dissolved and washed away by water combined with soap and alkalies; and if the ground of lodgment be thus destroyed, can the infection remain behind? To illustrate this, we may ask, why do malignant fevers so often invade the miserable retreats of poverty, so seldom the mansions of affluence and elegance? Because the former species of dwelling is as much distinguished for filth and fœtor, as the latter for neatness and splendour. But what is the difference in the economy of those dwellings? Poverty is shut up in low, small and crowded cells, where ventilation is impossible, and where ablution is neglected. On the contrary, the foundation of decent living is laid in a process of cleanliness which suffers no interruption. The means of this cleanliness are universally air, water, soap, ley and lime. We no where find fumigation added to this catalogue.*

It would be fortunate if these principles could be extended to vessels, which are no other than maritime dwellings and warehouses. A system of quarantine, organized upon this plan of cleanliness, might not only accomplish much more than it has ever yet done, but it might be abridged as to extent and duration, disincumbered of nearly all its inconvenient and oppressive restrictions, and accommodated to the safety and comfort of mariners, as well as to the activity and dispatch of mercantile speculations. Laws of quarantine may be so constructed as to render them, in their operation, bounties upon cleanliness and health, and thereby instruments of the most humane and salubrious reforms in the economy of vessels, as well as in the police of cities. The quarantine of persons and of cargoes, under such regulations, might be reduced to a smaller number of hours than it now consists of days.

Let it not be objected to these principles, that they depend upon theoretical opinions concerning the nature and constitution of pestilential matter. This practical management will remain unshaken, if every doctrine on that subject now taught should prove to be unfounded. Whatever chemical analysis may ultimately decide relative to this matter—whether it be considered acid, alkaline or neutral—this mode of purification, sanctioned by universal use, and immemorial experience of the great mass of the community, can never be abandoned.

The importance of the subject will serve, we hope, as an excuse for our frequent reiteration of these opinions.

MEDICAL REPOSITORY.

VOL. V.—No. II.

ARTICLE I.

An EXHIBITION *of several wrong* ASSOCIATIONS *of* IDEAS, *whereby* MEDICAL *and* CHEMICAL KNOWLEDGE *have been remarkably perverted and retarded: From a Letter of Dr.* MITCHILL *to* BENJAMIN RUSH, *M. D. Professor of the Institutes of Medicine and of Clinical Practice in the University of Pennsylvania, &c. &c. dated New-York, June* 10, 1801.

THERE is such difficulty in breaking established associations of ideas, that a great part of the toil of public instruction consists in pointing out those which are erroneous, and presenting in their stead such as are true. On moral subjects you know but too well how sometimes mankind continue in evil courses, through habit and imitation, without any deliberate intent to be sinners; and on physical questions you doubtless have remarked, that men are equally the dupes of mistaken opinions, because there are authority and fashion on their side, though they have no inclination to be wrong-heads. In both cases charity directs us to believe they are not influenced by any preference which they feel for error, but they oftentimes adopt it, and persist in it, through mistake, believing it to be truth.

Of the numerous examples that might be given of this, I shall, at present, only mention a few which have remarkably prevented improvement in the department of science wherein, of late, it has been my lot to be more particularly engaged. To show the cause of these misunderstandings will not be a very pleasant task; though, at the same time, if this is becomingly done, it can scarcely fail to be in some degree useful.

1. One of the prevailing errors is, *That the putrefactive process in animal substances, and in such vegetables as resemble them, being a copious source of deleterious and pestilential*

vapours, is characterized by affording a great quantity of volatile alkali.—If it can be explained how this mistake first arose, and was afterwards perpetuated, much will have been done towards its removal.

For the sake of making a fair statement of the opinions of philosophical men on the subject, I shall give a summary of the phenomena of corruption as stated by De Gorter, one of the most respectable of them at the time he published, which was in 1730. In his account of putrefaction, which may serve as an example of the whole, he first affirms (Medicinæ Compendium, 180) that the exhalations of many bodies, while they decay and rot, *are truly poisonous*. Having ascertained this truth, he relates how he proceeded to find out what this poisonous effluvium was. In this undertaking he very honestly and unintentionally deceived himself; and, having done so, he became instrumental, as is common in such cases, in misleading others. Instead of devising some mode of detecting the qualities of the noxious vapour as it rose in common temperatures, and under common atmospherical exposure, he put a parcel of the putrefying mass into a retort, that he might know its analysis by distillation. Treated by strong force of fire, volatile alkali was obtained; and volatile alkali was, of course, considered as the cause of all the mischievous effects wrought by the gases exhaling from corrupting bodies. (Ibid. Tract. xxxvii. § 4). This inference he judged to be fair and conclusive; and the interpretation which satisfied De Gorter has been deemed adequate and sufficient by almost every person since.

Their mode of reasoning, in plain terms, was this: Corrupting substances, exposed to a distilling heat in close vessels, afford ammoniac: putrefaction is a process analogous to distillation; therefore putrefaction produces ammoniac.

Now, any person the least conversant in syllogistic expressions will instantly perceive the faultiness and incoherence of the one just made; for the first and second terms clash with each other. Experience has abundantly proved, that the result of chemical processes is singularly modified by the prevailing temperature, or, in other words, *by the degree of caloric present;* and it has been as clearly shown, that in all instances of new combinations formed among the dissociated atoms of organized bodies, there is a certain natural order and succession, according to which the new products are formed; acids being produced first of all, and the other liquids and gases in their turn afterwards. Thus, when a body putrefies on a surface of earth heated to a

degree varying between the 85th and 120th of Fahrenheit's scale, acid and noxious fluids are frequently engendered; but when corrupting substances are acted upon by a degree of caloric as high as the 212th, which is the boiling or distilling point, combinations are formed from the very same materials, of very different constitutions and qualities. All reasonings, therefore, from the former of these instances, are wholly inapplicable to the latter, and conclusions from the latter are as little referable to the former.

De Gorter, indeed, seems to have been aware of the inconclusiveness of his experiments, and of his inferences from them; for directly afterwards he observes that the ammoniac did not exist, *before distillation*, in the smallest quantity, but was altogether produced *during the operation*. And really so little was his mind attached to any hypothesis on the subject, that after passing from the volatile to the *fixed alkalies*, he, in the next chapter (Ibid. Tract. xxxviii. § 15), praises them for their efficacy in cleansing sordid ulcers, for removing pimples, and for curing spots and blotches on the skin occasioned by an acid, and recommends them as excellent substitutes for the bile when that fluid is deficient: and then reverting to *volatile* alkali, he is so far from considering it as a poison, that he ascribes to it, among other qualities, those of an excitant and a cooler in many conditions of the constitution.

These observations which are offered to you concerning this writer, apply to all his followers and imitators to the present time, who have, unhappily for themselves and for science, associated the ideas of putrefaction and alkalescency, and cannot think of the one without bringing to mind the other, though there is no manner of necessary connection between the two.

2. A second error, connected with the first, and, indeed, in some measure growing out of it, is, *That the gall of animals, known to be of an alkaline quality, is a most dangerous excretion*, often becoming acrid and venomous, and stirring up that formidable class of diseases thence denominated "bilious."—If the charges against alkalies under the preceding head are unfounded and unjust, the accusations against the bile as a mischievous fluid, because an alkali, will be found totally destitute of support. It was natural enough, before men acquired a habit of nice discrimination, for them to attribute many morbid effects to the agency of the bile. Often, and in some of the most serious diseases, they beheld that liquid secreted in large quantities,

and sometimes with altered qualities; and as it struck their senses more than any thing else, they concluded it was the cause of the greater part of the alarming symptoms which they witnessed. Accordingly, fevers of various forms, where bile was copiously poured out, not to injure the constitution, but to protect it against the virus by which it was assailed, were falsely and injuriously denominated "bilious;" thereby suggesting to the mind that the "bile" was the exciting cause of the miseries endured. And this notion, groundless and untenable as it is, so frequently occurs to the eye in books, and to the ear in conversation, that almost every body assents to it as an established truth. So strong is this association of ideas between bile and fevers, that a long time must elapse before a prejudice so deeply rooted, and so widely spread, can be destroyed. Attend, if you please, to the violence of prejudice on this subject, as contained in the volumes of physic which lie before me.

So strong was the persuasion among the generality of persons, of the noxious quality of the bile, that BONETUS, the celebrated anatomist of Geneva, (Sepulchret. lib. iv. § 10.) made experiments to show they were in the wrong. A fashionable opinion in his time was, that the venom of the viper resided in its gall, and that this fluid, infused into a bleeding wound, excited a poisonous, or, in other words, a bilious disease in the body of the animal bitten. But BONETUS became convinced, by the experiments which he witnessed, that the bile of that serpent was not only destitute of poison, but was endowed with a balsamic and purifying quality; *at contrà pollere vi balsamicâ mundificante pluribus idoneâ.* This error being refuted, BONETUS went further, and proved that the *volatile alkali*, so far from being itself a poison, was an *antidote to poison:* for he relates the case of a young nobleman cured of the most alarming symptoms consequent upon the bite of a viper, by the free use of the *volatile salt of vipers.* The particular account of this antiquated remedy, and of its preparation and virtues, may be seen in *Triller's Dispensatorium Pharmaceuticum*, p. 613, where a number of authors is referred to. This antidote, the *sal viperarum volatile*, turns out to be neither more nor less than the *sal cornu cervi*, or salt of hartshorn of the shops; only that, instead of being prepared from the antlers of the deer, it was obtained from the cleansed and dried flesh of vipers. The dose was a quarter of a dram every half hour in treacle-water. This celebrated remedy of *volatile salt of vipers* is thus proved to be mere

ammoniac, or volatile alkali; and, what is remarkable, BONETUS speaks of it as known to every body in his time (remedio satis omnibus noto) for its antivenomous efficacy on brute animals as well as man.

On the innocent quality of *human* bile there occurs to me a good remark made by MALPIGHI. (Opera Posthuma. p. 22.) During the rage of a severe epidemical distemper in Pisa, in 1661, the philosopher BORELLI wrote to MALPIGHI for his opinion concerning it. MALPIGHI, in his reply, observes, among other things, that the bile cannot be the cause of the disease, because, in cases where large quantities of that fluid are mingled with the blood, as in jaundice and other similar diseases, no fever is occasioned thereby—"Di piu osservo che dove copia di bile confusa col sangue, *non segue febre*, come s'osserva nel itteritia et altri simili." This single objection is fatal to the hypothesis, and conclusive against the origin of fevers from absorbed bile. And still, notwithstanding its total opposition to truth, our wise men, as well as our weak men, talk of *bilious* fevers, and *bilious* colics, and *bilious* dysenteries, and *bilious* diarrhœas, arising from redundant and acrimonious gall, as familiarly and decidedly as they speak of drunkenness from distilled spirits, or of sleepiness from the juice of the poppy. But these are gross deceptions. The streams of bile which, in these instances, so startle and terrify them, are poured from their canals and reservoirs, not to disorganize or ruin the constitution, but instantly to mingle with the peccant humours and hostile acids which disturb the internal quiet and order of the system, and to bear them away to a distance, where they can injure no more.

The error into which we fall, in respect to the bile, is, that we mistake the effect for the cause. Something stimulates the duodenum or the hepatic ducts; and down comes a gush of gall to neutralize that something, and carry it off. The morbid stimulus, like a concealed enemy, eludes discovery by sight, but the friendly gall obtrudes itself upon the view. By a perversion common enough in life, the friend is mistaken for the foe, and loaded with curses and execrations accordingly.

3. There is a third error associated with the two already explained: *As alkalescency and putrefaction were associated, the bile being an alkaline fluid, was, of course, considered as highly putrescent.* Hence alkaline remedies have commonly been avoided in the diseases called "bilious," for fear of increasing their putrid tendency; or, if they were administered,

they have been so disguised by combination with acids or other things, that their prescribers did not direct them as alkalies, nor, in many cases, even know, by their names or qualities, if they were official preparations, that the remedies they ordered contained an alkali. In many such diseases acids have been the fashionable remedies, under the belief of their being grand antiseptics, and capable of correcting the corrupt degeneracy of the bile.

Alkalies, in their unconnected or caustic condition, are well known to be too active for employment internally as medicines, except in very small quantities. For this reason they are generally taken in combination with acids, and in these forms can be swallowed with safety to a considerable amount. These compounds, which are called "neutral salts," may operate in two ways; 1. They may increase the peristaltic motion, and operate as evacuants, without undergoing any decomposition in their passage; or, 2. They may suffer decomposition in the alimentary canal, if they meet with any thing there possessing a stronger attraction for either of the constituent parts of the neutral salts than the ingredients have mutually for each other.

But experiments innumerable have shown the predominating acidity of the stomach and intestines in many cases; and they have proved, also, that the acid abounding there can decompose many neutral salts by virtue of a more powerful attraction for their alkaline bases than these have for their own respective acids. Neutral salts, therefore, while passing through the alimentary tube, preserve their neutrality if they meet with no hostile acid; but if they do, they *break their neutrality*, and, in that case, act as alkalies. In many disorders where thirst is distressing, and acids earnestly called for and well relished by the sick, there is often an advantage in directing them, *not alone*, but *under*-saturated with alkali. Passing thus under cover of a weak and friendly acid, it is ready to subdue any more powerful and mischievous acidity which it may meet with. It is on this principle that muriate of soda, dissolved in acetous acid (that is, the celebrated mixture of vinegar and salt), is so good a remedy for dysentery. The discovery of its efficacy has been supposed to be very recent: this, however, is not the fact; for I remember the very prescription is mentioned by DIEMERBROECK, in his treatise on the plague which prevailed at Nimeguen in 1635, 1636, and 1637, (lib. iii. chap. 5, § XXI.) as an excellent *anti-pestilential* remedy. He relates that such as took full draughts of

it were thrown into a most copious perspiration, and obtained speedy relief. DIEMERBROECK even quotes authorities, if I mistake not, (ibid. § X.) for the cure of many patients, by drinking the clarified brine of pork and of anchovies. And in latter years, Dr. Wright's successful practice in dysentery, by means of sea-salt and lemon-juice, is generally known. And now, as I have referred to the old Dutch physician, I shall just remind you of his testimony in favour of *alkalies* in pestilential diseases. A number of the receipts he has left contain a portion of pot-ash. And he quotes several authors of note, who attest the benefit derived from alkaline salts. Pot-ash, obtained from carduus benedictus, scordium, wormwood, rue, scabious, mugwort and ash, he affirms, had all their warm advocates, because they were found both to *resist the malignity of the distemper and promote sweat.*

4. There is a fourth error respecting the word "nitre" and its meaning, which ought instantly to be corrected: *The "nitre" of the ancients was totally different from that of the moderns.* Ours is not the true "nitre," but only salt-petre, a salt which has been extensively but falsely called "nitre." It ought to have been distinguished in common language by some other proper and appropriate name, and not have been confounded with a substance which it resembles so little.

It is a curious question how the ancient term "nitre" came to be transferred to a substance so widely different from it as salt-petre is. It seems to have happened in somewhat the following manner:—Europe furnishes but small quantities of native mineral alkali, or "nitre." When, on certain occasions, it became difficult for the people of that enlightened part of the globe to get supplies of "nitre" from Egypt, it was a desirable object to find a substitute for so useful a remedy. On making trial of various things, it was discovered that the alkali obtained from the beech, the oak, and other trees (pot-ash), might be employed instead of the true and oriental nitre (soda). On carrying experiments further, it was found afterwards, that if the corrosive spirit was entirely separated and driven off from salt-petre, the alkali which remained (pot-ash) would not any longer burn, but would shoot into crystals, and operate charmingly in ardent fevers. Thus pot-ash from burned wood and decompounded salt-petre was substituted for native "nitre" (soda) in many cases. By degrees the substitute acquired the name of the original article. "Nitre" became the term to express the basis of *salt-petre*, and, by degrees, the same word which had signified the alkali

remaining *after* the separation of the acid, was applied to signify the undecomposed salt-petre, or pot-ash in connection with septic acid. Such, however, is the influence of names, that at length physicians gave themselves no trouble to separate the acid from salt-petre; but, under the delusion of its modern title, they gave, and still perniciously continue to give their patients the *septite of pot-ash*, where, according to the true intent and meaning of the case, they *ought to give them carbonate of soda.*

In this manner was the term "nitre," which originally meant what is now called *carbonate of soda*, perverted from its ancient meaning, and employed to denote *septite of pot-ash.* But it may be asked how this modern "nitre" acquired the name of salt-petre, or rock-salt, or sal-petræ? The probability is, that it was so called because it was found ready formed in earths and on calcareous stones and rocks (petræ). Though there is another story, that when Egyptian "nitre" grew scarce in Greece and the more western parts of Europe, there was a substance used in lieu of it, which was gathered in Macedonia, and known by the name of *alumen galasterium.* Among the ancients the term "alumen" was very vague; for "alumen catenum" is one of the names of the *cineres clavellati*, or pot-ash, as "alumen plumosum" is a species of asbestos, &c. Galasterium is derived from γαλα, milk, and στερεον, solid, because it looked like firm or coagulated milk: So "galactites," as Dioscorides relates, was a milk-coloured concretion growing out of a lime-stone, &c. This "alumen galasterium," then, was a white and compact alkali, and though not soda, yet, from its resemblance to that alkali, and its substitution for it, was distinguished, at length, improperly enough, by the old appellation "sal nitri," and afterwards by the more modern denomination "sal petræ." And the latter name was continued even after the acid of putrefaction, floating in the atmosphere, had been attracted by the alkali, and associated with it into a neutral salt.

If the word "nitre" had been diverted from its primitive signification no further than to mean the fixed vegetable alkali, or pot-ash, either in its simple form, or in conjunction with carbonic acid, there would have been some confusion introduced into science thereby, but the practical inconveniences would not have been very serious. They would have amounted to little more than the *employment of carbonate of pot-ash* instead of *carbonate of soda;* and, generally, this would have been an innocent exchange. But when it is perverted, and

extended so far as to mean the neutral salt composed of the *acid of putrefaction and pot-ash*, the consequences of such an abuse of language are of a solemn and alarming nature. I shall mention *two* of them: 1. The ascription to the venomous and nauseous drug, salt-petre, all the excellent and salutary medicinal qualities for which the "nitre" *of the ancients* was justly celebrated: and, secondly, the exhibition of this *modern* "nitre," or salt-petre, ignorantly and injuriously, by physicians to their suffering patients; whereas, if they had fully comprehended the subject, they would, instead thereof, use the benign and salutary "*nitre*" *of the ancients*, or carbonate of soda. If my physician, miscalling jalap by the name of *Peruvian bark*, should *actually* give me parcels of the former, when he *verbally* prescribed the latter, I should think him a very unsafe practiser, at least where those two remedies were concerned. And equally unsafe is he who, giving to so deleterious a thing as salt-petre the name of so safe and admirable a medicine as "nitre," *in its ancient sense*, harasses the sick by portions of the former, instead of comforting them by doses of the latter. This is an important point of practice, and deserves immediate attention from all prescribing physicians and all intelligent patients.

This "nitre," collected from the neighbourhood of Naucratis and Memphis, possessed, among others, the following properties: If *meats* were salted with it, they turned white, and looked the worse for it; but if it was sprinkled on pot-herbs and sallads, they turned to a more beautiful green: if a man, having an ulcer on any part of his body, frequented the pits where it was collected, the sore soon healed up and skined over: prescribed in tincture, decoction and cataplasm, with various vegetable substances, it was good for pimples, tetters and eruptions, and especially for breakings out and exulcerations on the face, for spots in the eyes, for soreness and raggedness about the finger nails, and for the tooth-ache, if applied to the mouth and gums: it was reckoned an excellent dentifrice, and restored blackened teeth to their natural whiteness: when made up into ointments, plasters and liniments, it was good for corroding ulcers, and for the bites and stings of venomous creatures: it was excellent for burns, and might be administered in clysters advantageously for a flux of the belly: it corrected the rank smell from the arm-pits, if they were washed with a solution of it in water: with oil it formed a good mixture to anoint the whole body with before the cold fits of agues; and the same ointment was good against leprosy and unseemly spots and freckles which blemished the skin. Such were the

qualities of "nitre;" yet, unhappily for medicine and the kindred arts, when salt-petre was invested with its *name*, it was presumed to possess its *virtues* also, while "real nitre," stripped both of its title and its property, was obliged to yield to the claims of the usurper, and to go into a long and ignominious exile. But the day of restitution is at hand, when *salt-petre* must lay aside its fictitious and assumed character, and "nitre" be restored to its former honours and possessions.

Of salt-petre it may be worth the while to observe, that it was known to the gentlemen of the Academia del Cimento at Florence, before the year 1667, that a fish, put into a watery solution of it, would die in two minutes, and its gills would be ruddy. (Tentamina Natural. &c. p. 123.)

5. Before I conclude a fifth error remains to be considered: this is, *That lime or calcareous earth is a septic substance, and promotes putrefaction at a rapid rate.* So general is this belief, that the idea of lime has of late been almost invariably associated with that of putrefaction. Even in agriculture calcareous earth has been recommended for the purpose of promoting the corruption of animal and vegetable substances on the land.

This opinion seems to have been adopted about the middle of the eighteenth century, and chiefly on the credit of PRINGLE's experiments. But facts of a different import are found among the older writers. For instance, FABRICIUS AB AQUA PENDENTE, who flourished toward the end of the sixteenth century, has informed his reader (Opera Chirurgic. lib. i. cap. 24) of the usefulness of the *calcareous powder* of the shells of *snails* and river-*crabs* (elimacibus et cancris fluviatilibus) in cancers. For ulcers difficult to heal, and overflowing with vitiated humours, burned *oyster-shells* and quick-lime are ingredients in some of his receipts for dressings. *Calcined hartshorn* and *washed lime* enter into some other of his formulas.

ETMULLER declares (Oper. Medic. tom. i. p. 807), that the lime-water formed by pouring common water upon calcined marble, strange as it may seem, was extolled for its virtue in gangrene, and a plaster of the lime itself used as a secret remedy for gangrenous ulcers. But it is not necessary to multiply authorities.

I shall, however, bring to your recollection the amusing account given by Mr. BRYDONE (Travels into Sicily, &c. vol. i. p. 326) of the calcareous earth collected in Malta. On that island is a grotto, rendered famous and venerable for having been visited by the Apostle PAUL. From the surface

of the rocks, in many spots, they scrape off a powder which is formed by a crumbling or decomposition of the *free-stone* of which this excavation, and, indeed, the whole island, consists. This the people collect with great care, put it up in boxes, and export it to various parts of the world *as a medicine*. It is celebrated for its efficacy *in small-pox and fevers*. Though this remedy was probably introduced by superstition, there can be no rational doubt entertained of its being a very proper prescription in various states of those diseases.

To the calcareous earth around the city of Bath, in England, and in its waters, is ascribed the immunity of the inhabitants from the ague. The author of this opinion is Dr. LYSONS; and LYSONS was a Bath physician, and wrote observations on the qualities and effects of the mineral waters there.

There are two words much employed in discussing subjects of this sort, to which there is very little of precise meaning annexed. The words I allude to are *acrid* and *acrimony*. What is to be understood by them? An old French writer has left something which tends towards an answer of this question.

RAYMUND VIEUSSENS, of Montpellier (Tractatus De Remot. et Prox. &c. cap. 20 and 21), divides salts into "acrid" and "acid." The former of these, the *acrid salts*, have, by the moderns, been denominated *alkalies*. Hence we have the original meaning of *acrid* as synonymous with *alkaline*, and of *acrimony* as meaning the same with *alkalinity*. But the term has been since abused, and extended to arsenic, alum, and almost every thing of a corrosive nature. VIEUSSENS, I will just observe, was a most strenuous supporter of the *acid nature* of the exciting cause of fevers. (Ibid. p. 272, 273.)

These attempts to relieve the mind from the tyranny of ancient error are among the most irksome of literary labours. But this is not the worst; for he who does them must expect such raillery as the following from the rambling versifiers of the age:

> Forth steps the spruce philosopher, and tells
> Of homogeneal and discordant springs
> And principles; of causes how they work
> By necessary laws, their sure effects
> Of action and reaction. He has found
> The source of the disease that nature feels,
> And bids the world take heart, and banish fear.
>
> COWPER.

But the zealous lover of truth must disregard such idle raillery.

Yours, &c. &c.

ARTICLE II.

An ACCOUNT *of the* SALUTARY EFFECTS *of* BLOOD-LETTING *in curing the* DISEASE *brought on by taking excessive Quantities of* OPIUM: *In a Letter to Dr.* MITCHILL, *from* BENJAMIN RUSH, *M. D. &c. &c. dated Philadelphia, July* 8, 1801.

DEAR SIR,

ACCEPT of my thanks for your ingenious letter upon the influence of association in perpetuating errors in Chemistry and Medicine. The same operation of the mind has much to answer for in keeping up most of the errors of every other branch of science. To dissolve false associations, and to combine facts according to their natural and just relations, appear to constitute perfection in the intellectual faculties of man.

In return for your polite favour, I shall now communicate to you an account of the salutary effects of a new remedy in the cure of the disease brought on by taking excessive quantities of opium.

The disease is a plain one. It is the result of a powerful stimulus acting upon every irritable part of the body, and generally prostrating their actions, or, in other words, suffocating the excitement of the whole system. Exactly the same phenomena are often produced in the body by the miasmata which induce yellow fever. Reasoning from this analogy, I have prescribed the same remedy in the former as in the latter disease, and with success in four cases. The remedy is BLOOD-LETTING. In two of the cases it was very copious. In one of them the blood exhibited an inflammatory crust. An emetic was given in three of the cases as an auxiliary remedy, and would have been administered in the fourth, had not the recovery from bleeding been so rapid as to render it unnecessary. You will not expect me to mention the names of the persons who have been thus happily saved from the grave, when I add, that the opium was taken by each of them to produce voluntary death. The young gentlemen who administered the remedies to three of the above patients, under my direction, were Dr. William Alston, now of South-Carolina, Mr. Thomas Rowan, and Mr. John Wooten. The fourth patient was attended exclusively by Dr. Caldwell and myself. He had taken the opium in a paroxysm of temporary derangement.

Do not suppose I wish to recommend the indiscriminate or exclusive use of the lancet in the disease which has been mentioned. Bleeding should never be prescribed until great morbid action, or the suffocation of action from excess of stimulus (manifested chiefly in the depressed state of the pulse) have taken place. Previously to the appearance of these symptoms, an emetic alone often gives relief; and after bleeding, sinapisms of mustard seed, the warm-bath, spirit and water, and perhaps Dr. Seaman's remedy of stripes, appear to be indicated.

If you think the above facts worthy a place in your excellent Medical Repository, they are at your service.

With the most cordial wishes for the success of your labours for the benefit of mankind, I am, dear Sir,

Your sincere friend,

BENJAMIN RUSH.

ARTICLE III.

Some THOUGHTS *concerning* DREAMS. *By* JOSEPH PRIESTLEY, *LL. D. &c. addressed to the Editors of the Medical Repository.*

GENTLEMEN,

THAT ideas have a permanent existence in the mind cannot be denied, because sometimes voluntarily, and sometimes involuntarily, they occur long after their first introduction. The brain, therefore, by means of which the mind is furnished with all its ideas, and which is the repository of them, must be of such a texture as not only to receive, but firmly to retain, the impressions that are made upon it by the external senses. It must also be capable of keeping them in a dormant or quiescent state: for ideas may be forgotten, and, at a great distance of time, recollected, and yet with the greatest certainty of their being the same that they were at the first. By what kind of mechanism this is effected is one of the great secrets of nature; but the opinion of Mr. Hartley, or rather of Sir Isaac Newton, seems the most probable, viz. that, during the presence of any sensation, some part of the substance of the brain is in a vibratory motion, and that in retaining a disposition to vibrate in the same manner consists the dormant state of the ideas communicated by sensation.

On any hypothesis, the disappearance of any particular

train of ideas, by their falling into a dormant state, must consist in the inaptitude of the region of the brain to which they belong to be excited; and, in the case of sleep, this may be owing either to the *compression* of a part or the whole of the brain, so that it shall be kept by force from performing its usual functions; or to *relaxation*, similar to that of the fibres of the muscles in the same state. And as one of these is evidently the cause of the other, the muscles being necessarily relaxed during sleep, it is the more probable that they are both affected in the same manner, at the same time.

In whatever it be that this dormant state of ideas consists, I cannot help inferring, from certain phenomena in dreaming, and also in delirium and intoxication, that in the brain, which is a substance of considerable size, there are different regions, in some of which ideas may be reposited out of the reach of ordinary excitement, but in which they may be revived in particular circumstances, so that few or no impressions ever made upon the mind are wholly lost; as was observed by Dr. Rush, in a very interesting note to his *Life of Mr. Drinker*, Essays, p. 296.

That there actually are regions of the brain, the repository of ideas and of knowledge, which are sometimes out of the reach of voluntary excitement, is evident from some persons entirely forgetting certain languages when they are in health and sober, and speaking them fluently in a state of delirium, insanity, or intoxication, of which some remarkable instances are given by Dr. Rush, in the note above-mentioned. One is of a French Countess who had forgotten the Welch language, which she had learned of her nurse, and yet spake it, and no other, in the delirium of a fever; and another of a young man who, he told me, was a fellow student with him at Edinburgh, who spoke French fluently as he was conducting him to his lodgings, after drinking too much; though the next day he not only remembered nothing of it, but was unable to speak that language at all: but he had been well acquainted with it when he was a boy. That this knowledge of these languages, and, consequently, the ideas that were the elements of it, actually existed in the mind and the brain, though in a dormant state, cannot, therefore, be denied: for in a state of extraordinary excitement, or excitement of a peculiar kind, the knowledge of them was actually revived. I have heard other facts of the same kind very well authenticated.

In a state of perfectly sound sleep, all ideas, as far as appears, remain in this dormant state. But this, I believe, is the case with very few persons: for most persons never sleep without dreaming more or less: that is, though many of their ideas are in a dormant state, others are not so, but occupy the mind, and sometimes even agitate it to a great degree, almost as much as in the most intense exercise of its powers when awake.

With some persons these sleeping thoughts are a continuation of those with which the mind was occupied when it was awake; but with myself, and many other persons, this is very rarely the case, the sleeping thoughts having no connection whatever with the waking ones. On the approach of sleep they may be observed to come from some very different quarter, and gradually to exclude the others. Consequently, while one part of the brain is either compressed or relaxed by sleep, and the ideas belonging to it become dormant, other parts are more excited; so that the ideas reposited in them come forth, and occupy the mind till the approach of vigilance. This circumstance was first observed to me by an ingenious friend in England, and since I have heard it I have given particular attention to it, as much, at least, as the nature of the case will admit: for a person must awake in particular critical moments to be able to make any observations of the kind.

I remember, however, that before I heard this remark of my friend's, I once awoke from a dream attended with circumstances exceedingly favourable to his idea, and the hypothesis above-mentioned. I thought I was attending a public speaker, whose vociferation was very loud, and his tones very peculiar. Before the harangue was concluded I awoke. But still, though no articulation could be perceived, I had a distinct hearing of the peculiar tones of the speaker, resembling notes in music; and, lying perfectly still, I attended to the sound a sensible space of time. To satisfy myself that I was really awake, I opened my eyes, and saw distinctly every thing in the room in which I lay. How long I might have retained this sound, remaining from my dream, I cannot tell; but on a very slight motion of my head it instantly disappeared. Some time after this I awoke from another dream in similar circumstances. I thought I was examining an unfinished building, and, standing on some rafters near the roof, I heard two of the carpenters speaking very loud to each other; and, awaking, I very distinctly heard the sound of their voices, a

short time afterwards, though I could not distinguish any of their words.

In these cases it seems evident that the region of the brain in which the dreaming thoughts prevail must have been different from that which is occupied by the waking ones, and that one of the trains of ideas excluded the other.

If I might indulge a conjecture on so obscure a subject, it would be, that the region of the ideas which occur in dreams is more deeply seated, and, therefore, that this interior part of the brain is not so soon affected by the cause of sleep as the exterior part. If sleep be occasioned by the compression of the brain, as experiments made on the Parisian beggar (who could be made to sleep at pleasure, by pressing that part of his brain which was not covered by the skull) seems to make probable, some light may be thrown upon it from the consideration of the state of the brain during sleep, when it is said all the arteries of the body are more empty, and the veins more full, than in a state of vigilance.

In the brain the veins do not accompany the arteries, as in other parts of the body, but enter the skull, and issue from it in different places; and the ramifications of the veins spread over the lateral sinuses of the dura mater, which incloses the brain. During sleep, therefore, the external parts of the brain will be compressed by the distention of these veins, while the arteries in the interior part being less distended than in a state of vigilance, those parts of the brain that are contiguous to them will be relieved from their usual pressure.

If the disappearance of ideas in sleep be owing to a relaxation of any part of the brain, it is possible that, on this very account, other parts, at some distance, may be in a state of greater tension, the principle of excitability, whatever it be, being, as it were, concentered in them. But I am by no means satisfied with these conjectures, and only mention the facts in order to draw the attention of anatomists and physiologists to a subject highly interesting, and not yet unexplored.

It is something favourable to the hypothesis of the ideas excited in dreams having their seat in some region of the brain more deeply seated than that which is occupied by our waking thoughts, that many persons (and I am one of the number) seldom dream of any thing that is recent. The persons that occur in their dreams are generally those that have been long dead; but yet they are never considered as having been dead, but as alive, and they speak and act in their proper characters.

It seems to follow, from this, that only that part of the brain is at rest which was occupied by the more recent trains of ideas, while those which penetrated deeper are not so much affected by the cause of sleep. But at one time those ideas must have occupied the regions affected by sleep, and I am unable to form any tolerable conjecture how they have come into a different situation. I therefore leave the subject to the greater ingenuity of your numerous readers, and am, gentlemen, yours, &c.

J. PRIESTLEY.

ARTICLE IV.

Some OBSERVATIONS *on the* BLACK-VOMIT: *Communicated by Dr.* P. S. PHYSICK, *of Philadelphia, to Dr.* MILLER.

HAVING, in the years 1798 and 1799, had frequent opportunities of dissecting the bodies of persons who died of the yellow fever in the City Hospital, I had thoughts of publishing a circumstantial detail of the several appearances in each case. On perusing, however, the descriptions given by late authors, I find but little to add to them, except some observations respecting the black-vomit, which do not appear to have been particularly noticed.

The common opinion was, and, for any thing I know to the contrary, is, at the present time, that this black matter is poured out by the liver: the dark coloured appearance of the bile, in its accumulated state, approaching more to the colour of the black-vomit than any other secreted fluid, would very readily induce a person to conclude they were the same, if he did not compare and examine them carefully, and likewise attend to several other circumstances.

By such an examination the following differences have been observed.

First. If the darkest coloured bile be spread thinly over a white surface, such as the skin, it loses the black colour it had in its accumulated state, and appears of a yellowish green colour: but if the black-vomit be treated in the same way, it retains its black or dark brown appearance.

Secondly. The bile in the gall-bladder has its common bitter taste, but the black-vomit is generally insipid, or nearly so. This fact has been ascertained by several persons, and,

among others, by the late Dr. S. Cooper. I have inquired of a number of patients just after they had vomited it: they almost all of them declared it to have no taste, and the organs of taste were proved to be perfect in these people, by trying whether they could distinguish between different tastes. It occasionally happens, that violent efforts made in vomiting will force some bile out of the gall-bladder into the stomach, and then the black-vomit will have a bitter taste, like bile. Dr. Cooper twice found it intensely bitter, owing to this circumstance; which, however, is a rare occurrence.

Thirdly. The black-vomit differs very much from any mixture that can be made of the dark coloured bile with any of the fluids found in the stomach or intestines. If bile be mixed with the mucus of the stomach, or if some of it be added to the black-vomit, it mixes with these uniformly, and imparts a yellowish green tinge to them. The nearest resemblance to black-vomit that could be made, was by mixing some of the mucus of the stomach, a little blood, and some of the bile together; but the difference was still very obvious.

Fourthly. The stomach has been found full of black-vomit, when, in the same subject, the fluid in the gall-bladder and biliary ducts was very different from it in its colour and appearance. I have found the gall-bladder filled with a fluid of a brick-dust colour; in some others it contained a fluid of a light green colour; and in others a transparent and colourless fluid, resembling the white of an egg, only that it was of a thinner consistence. In some instances, again, a purulent coloured fluid was found in them. Some of the same kind of fluid which the gall-bladder contained, in these last-mentioned instances, was generally found in the duodenum—the stomach, in the same body, containing black-vomit.

Fifthly. The pylorus, in several instances, has been found closely contracted, and yet the stomach contained black matter.

The above observations have appeared to me to overthrow the idea of the black-vomit being secreted by the liver. The question, however, still remains, from whence is it derived? I believe it to be a secretion from the inflamed vessels of the stomach and intestines—and for the following reasons:

1st. It is found in these viscera when it cannot be detected in any other organ or cavity connected with them.

2dly. It is often found of so thick a consistence that it does not mix with the fluids of the stomach: in such cases it ad-

heres to its inside, forming a black coat of considerable thickness; and, when it is once scratched off, it cannot be made to adhere again in the same manner.

I have, in one instance, observed this black substance, in two almost circular patches, each about two inches in diameter, adhering to the stomach—all the other parts being free from it. In this case there was no black matter loose in the cavity of the stomach nor intestines. On scraping it off, the spots which had been covered by it were found inflamed, and these spots only. Now, it can hardly be possible for this black substance to have got into such a particular situation had it been secreted by the liver; and some of it, in that case, would have been observed in the gall-bladder, gall-ducts, or duodenum. It must not be conjectured that the black-vomit irritated the stomach, and produced the inflammation. On the contrary, Dr. May frequently repeated an experiment which proved it to be very bland. He dropped it into his eyes, and never experienced any more inconvenience from it than if water had been used. When the hands have been irritated in dissecting, which once occurred to myself, I believe it has arisen from some acrid substance having been swallowed by the patient just before death—as elix. vitriol, alkal. volat. &c.

Fourthly. I have seen the inside of the inflamed stomach as black as the black-vomit, resembling it in colour exactly. In most of these cases no black matter was found in the cavity of the stomach. The vessels only which were inflamed were distended with it. This colour differs very much from the dark purple of a part in a state of gangrene. And I never observed any putridity attending it. This blackness has, in some stomachs, been universal—in some in spots only: other spots being in a state of high inflammation, giving the inside of the stomach a checquered appearance. These spots, in one instance, were seen resembling each other in shape and figure exactly, and were in every respect alike, except in colour—the one being red, the other black. Here some of the inflamed vessels only had gone into the act of forming black matter, but did not excrete it.

The secretion of black-vomit appears to be one of the most common modes in which violent inflammation of the stomach has a disposition to terminate. Death, however, in general, takes place before it entirely disappears. I have seen many cases which show that the inflammation is diminished by the secretion—of which it will be sufficient to mention the fol-

lowing: On opening a stomach, one half of it was coated with adhering black matter, while the other half was free from it; on scraping it off clean, and comparing the part underneath with the other half of the stomach which had not secreted any black matter, the difference in the degree of inflammation was very striking, being much the least in the part which had been covered with the black substance.

In some cases, where the vomiting of black matter had been considerable in quantity, or continued for several days, the inflammation was found very faint indeed; and, in some, the inside of the stomach appeared as if covered over with a vast number of small glands, like mucous follicles crowded together.

Philadelphia, October, 1800.

ARTICLE V.

The good Effects of SNEEZING *in* HYDROCEPHALUS: *Communicated in a Letter from Dr.* MALACHI FOOT, *of New-York, to Dr.* MITCHILL, *dated June* 27, 1801.

DR. DARWIN, after having established, generally, the doctrine of retrograde motion, as one of the functions of living bodies, in his observations on hydrocephalus internus, (vide class i. 2. 3. 12.) has the following sentence:—"As by stimulating one branch of lymphatics into inverted motion, another branch is liable to absorb its fluid more hastily; suppose strong errhines, as common tobacco snuff to children, or one grain of turpeth mineral (hydrargyrus vitriolatus) mixed with ten or fifteen grains of sugar, was gradually blown up the nostrils."

In treating of lymphatic catarrh, catarrhus lymphaticus, (vide class i. 3. 2. 1.) he questions, "Could such a discharge be produced by strong errhines, and excite an absorption of the congestion of the lymph in dropsy of the brain?"

The frequency and formidable nature of hydrocephalus internus, even under the present most improved mode of treatment, is my only apology in stating to you the following case.

A child of mine, aged five years, of slender habit, was in the last winter attacked with the usual symptoms of dropsy of the brain, which, in a short time increased to a most alarming

degree. After making use of the usual means, such as one sparing blood-letting, repeated evacuations with calomel, and a repetition of epispastics, I found his situation as follows: irregular febrile paroxysms, dilated pupil of both eyes, more particularly of the right; strabismus when awake from sleep; a starting up in bed, with a wildness of countenance, and an absence of all sense of time and place; together with these, an enlargement of the whole right side of the head, so evident as to be discernible even at the first glance of the eye. In this stage of the disease, though despairing of relief, I had recourse to common Maccabau snuff, as an errhine. The effect of this, after a few repetitions, was, on every application of the remedy, a violent sneezing, followed by a discharge from the nose of a limpid fluid, at least apparently different from the usual secretions of that part, in quantities exceeding any thing of the kind I had before noticed from the use of the most powerful errhines. The discharge which succeeded a number of applications of the snuff, was so copious as to completely wet a common sized handkerchief in fifteen or twenty minutes. The unexpected effect of this article in producing so copious a discharge, and an obvious abatement of the more alarming symptoms, encouraged its continuance, until, by a gradual subsidence of all of them, he, within a few days, became wholly out of danger. The continuance of the snuff was intermitted, as the discharge lessened, and succeeded by the use of some simple articles of the stimulant class, which were pursued until his health was established. It may not be improper to note, that the disease evidently owed, at least its exciting cause, to concussion; and it is worthy of notice in this case, as a circumstance which led more immediately to the use of errhines, that the usual discharge from the nose, during the complaint, was absent, and that the air on every act of breathing, in passing over the dry membrane of the part, produced (if I may be allowed the expression) a dry whining sound, such as ever attends a want of secretion on that membrane. The general habit of this subject, which, even previously to this period, had been unusually spare, immediately assumed a degree of vigour, and, instead of constant invalidity, his health has been without exception complete.

How far the above case may go towards establishing the knowledge of an immediate association between the nasal vessels and those of the internal cranium, and between the latter and those of the external head generally, and how great a share an opposite state of these two sets of vessels may have in producing and continuing diseases of the brain, I shall not at-

tempt to decide; nor need I offer an opinion, how far the successful treatment of diseases in general, must depend on a thorough knowledge of the various associations of the several parts which compose the human body. Suffice it to observe, that if an argument in favour of the association of particular parts can be drawn from the circumstances of their contiguity, as is exemplified in the sympathy of the lower portion of the intestines with the lower extremities, of the urinary bladder with the external surface, of that surface with the stomach, of the stomach with the lungs, and of the latter with the vessels of the upper part of the trunk, neck, and face—by a parity of reasoning, we are led directly to a belief, that the same condition may subsist between the two sets of vessels now in question. The comparative fatality of diseases of the brain, renders this a subject, in physiological investigation, of no small importance; and, by a decision of it, we shall probably be conducted to an auxiliary in the increase and subduction of external stimuli, which (reasoning from analogy) promises a degree of success, if we except some cases related by Dr. Darwin, hitherto unexperienced in diseases of that organ.

ARTICLE VI.

A singular Case of HYDROCELE: *Communicated in a Letter from* EDWARD DARRELL SMITH, *M. D. of Charleston (South-Carolina), to Dr.* MILLER, *dated May* 30, 1801.

CAPTAIN W———, aged thirty-four years, of a robust constitution, and florid complexion, was attacked with intermitting fever in the latter end of March. The paroxysms assumed no regular form, and in a few days were nearly subdued by the common remedies. From the commencement of his indisposition he had found some difficulty in passing urine, amounting at length to an almost total obstruction. Upon making a violent effort, a substance was expelled with considerable force, which he described as cutting the urethra, and followed by some blood; but it being night, the nature of the substance could not be ascertained. In the course of the succeeding week, he discovered that the scrotum began to tumify, and the urine to be diminished in quantity. Alarmed by these appearances, he applied for assistance to Dr. Stevens, on the 9th of April. At this time the swelling was not great, but

the dysury was considerable, and attended with fever. Diuretics were administered without affording any relief. Mercury was then prescribed, with a view to excite the absorbents into action, and carry off the effused fluid in that manner; but the tumour continued to increase, and all the other symptoms to be aggravated until the 14th, when they became extremely urgent. The body was costive, the pulse quick, tense and small; no water had been voided for forty-eight hours; the scrotum enlarged to the size of a man's head; the penis amazingly tumefied; the pubes and thighs hard and swelled, and all the parts much inflamed. A cathartic, given early in the morning, produced several evacuations by stool, and somewhat relieved the patient; but the distress was still so great that it was resolved to evacuate the fluid contained in the scrotum by an operation. In the afternoon I visited the patient, by invitation, with Dr. Stevens. Upon examining the parts, we found that in the most depending portion of the scrotum, on the left side of the raphe, a gangrenous spot, of the size of a dollar, had made its apppearance, although not visible in the morning. In this spot a lancet was introduced to a considerable depth, and the puncture enlarged afterwards, without the patient's being at all sensible of the wound. A viscid, glairy matter was first discharged, then a little blood, and, lastly, yellow water; all of which were extremely offensive. The contained fluid did not escape so freely as was expected; and after discharging a little more than an half pint ceased to flow. On going to stool several times, the patient observed the matter to run more freely, and while in bed it continued to be discharged gradually; the next morning the 15th, Dr. David Ramsay was called in consultation, and, on visiting the patient, it was found that he had passed a good night, his fever less, body open, and nearly a pint of urine voided at once through the penis. The tumour was somewhat lessened; but as the gangrenous appearance was alarming, it was agreed to administer the decoction of bark freely, the body being also kept open. In the evening the symptoms still more abated, and water passed freely four times in the course of the day. Solutions of sacch. saturni were directed to be applied constantly to the inflamed parts. On the 16th and 17th the fever had disappeared, and every other symptom was favourable. On the 18th, the gangrenous portion appeared disposed to slough off. The discharge having stopped, the puncture was enlarged considerably—penis nearly reduced to the natural size. On the 19th the opening was still more enlarged, when the fœtor became more sensible; a portion of

cellular substance protruded and was removed—directed to take the bark in substance every two hours; in the afternoon a part of the gangrenous portion sloughed off, and was followed by a considerable discharge. From this until the 25th he continued to grow better; the gangrenous portion sloughed off entirely, leaving a considerable cavity. The penis was now in a natural state, and the hardness and swelling of the pubes subsided. About this time a number of boils broke out on his left thigh, near the groin, which occasioned considerable pain, but went away in a few days. Common dressings were applied to the scrotum, and granulations having filled up the cavity by the 14th of May, the patient was declared well. The bark was continued until within a few days of this period. Where the wound was, the scrotum does not appear as in other parts, but there is a small pit, or depression occasioned by the cicatrix; the testes do not appear to have suffered any injury.

In forming a conjecture concerning the nature of this extraordinary tumour, we were involved in much perplexity. The history of the case precluded the idea of its arising from any venereal affection, hydropic diathesis, hernia, &c. There was but one mode in which this swelling could probably have been produced, viz. an opening from the urethra into the scrotum, affording a passage for the introduction of some fluids. The attending circumstances warranted this conclusion. The patient had been afflicted previously with symptoms of gravel, but had never passed any particles of that nature. The difficulty of voiding urine for some days before, and the pain and cutting at the time of the expulsion of the substance which appeared to be the occasion of the tumour, induced us to suppose that this substance was of a calculous nature, and in its passage had abraded the urethra so much that the urine found its way through some part into the scrotum. This opinion is corroborated by the fact, that, during two days of entire suppression, the scrotum increased enormously; but after an external opening was made, and the urine began to flow through the natural channel, the swelling never became larger, although the discharge was very slow and gradual.

It may not be amiss to remark, that the patient has not since been troubled with any symptoms of gravel, or difficulty of passing urine.

ARTICLE VII.

On the TOPOGRAPHY *and* DISEASES *of* GREENEVILLE, *on Tar-River (North-Carolina): Communicated by Dr.* G. PILLSON, *of that Place, to the Editors of the Medical Repository.*

GENTLEMEN,

AS coinciding with the plan of your valuable publication, and in some degree supplementary to the observations of Dr. Williamson, in vol. ii. p. 145, second edit. of the Medical Repository, "On the ill Effects of Blood-letting in Putrid Bilious Fever and Pneumonia Typhoides, as they appear in North-Carolina," I have ventured to transmit to you a narrative of the febrile complaints which have occurred in this town and the vicinage thereof, as far as my practice and knowlege have extended, since July last. Young in the practice, and so immediately under the eye of many practitioners of celebrity and talents, I felt a diffidence in the attempt, not otherwise to be overcome than by a recollection of the neglect under which the subject has lain since Dr. Williamson's notices thereof, and the probability of its exciting a further attention in some gentleman of the faculty of longer experience and more accurate observation; thereby providing for the younger practitioner hereafter some practical hints for his conduct not to be found in the systems of physic of the schools.

With a view of preserving some method, I shall premise such a description of the local and relative situation of the town as may come immediately within the object of a medical essay.

Greeneville is a small town on the south side of Tar-River, built on a pleasant spot of considerable elevation, and nearly insulated by the river, and two branches on the east and west sides of the town, whose sources are but a short distance apart. The land on the north side of the river is low, broken by ponds, and subject to be overflowed during a fresh, which occurs five or six times a year, and to such extent as to cover the low land half a mile distant from the bank. The branches are constantly supplied with water from a variety of springs which issue from their high banks, and also receive the river water during a fresh. Their miry state, in many places,

renders them dangerous to cattle tempted in by the tender grass they afford in the spring. The low grounds immediately opposite to the town are yet in a state of nature, except a field of three or four acres, which, since it has been cleared, is considered to affect the health of the inhabitants situated nearest to the river. South of the town, and nearly a mile distant, is a mill-pond, the dam of which accidentally got broken during the summer, by which a considerable extent of its muddy bottom and decaying trees were exposed to a hot sun for nearly two months. The land between the town and this mill-pond is mostly under cultivation. The usual complaints of the town and country are not distinguishable, in general, from those of other low parts of the State, in the same season of the year; however, I believe the fevers of the last year have been more particularly marked.

Early in July the dysentery made its appearance in a house farthest removed from the river. The first attacked was a female eighteen or twenty years of age. I attempted the cure according to the old mode, so often and repeatedly recommended by medical writers—namely, by first evacuating the stomach by a full dose of ipecacuanha, and afterwards exhibiting small doses of rhubarb and ipecacuanha, occasionally interposing an opiate to mitigate pain. The exhibition of the rhubarb and ipecacuanha did not answer the good purposes I expected from their use, constantly keeping the stomach in a state of nausea, and failing to keep up a regular and easy discharge by stool. Other purgatives were used accordingly, as salts, castor oil, &c. Having perused Dr. E. Miller's essay on the Cholera Infantum, I was induced to try the combined effects of calomel and opium. I therefore prepared pills, composed each of three grains of the former and one of the latter, with directions for the use of one every sixth or eighth hour, according to their effects. The operation of these perfectly answered the indications of cure in this disease; viz. a free and regular discharge of excremental matter from the intestines, and a relief from violent pain. A continuance of their use for six or eight days completed the cure, without the aid of any other remedy except occasionally directing magnesia for an acidity of the stomach, and the use of lime-water with an equal proportion of milk. Milk was used early in the complaint, by the advice of a friend, and constantly adhered to, from the relief experienced in its use as a demulcent, especially when churned until butter began to appear, and it was thus drank without separation.—Her three brothers were attacked

in succession, and each began the use of the calomel and opium on the first appearance of disease, and with the same happy effect. The disorder did not, however, appear in any other family in town; to which its remote situation, and the dread of infection thereby preventing a free intercourse of the inhabitants, contributed; and by the last of the month no traces of it were to be found.

The four succeeding months were distinguished, as usual, by a prevalence of bilious intermitting and remitting fevers. The most distressing symptom in each was a severe pain of the head, in some cases so violent as to amount to constant delirium; nor do I recollect a single patient exempted from it; and most commonly accompanied with an insupportable pain of the back, the seat of which was the lumbar region. The head was invariably relieved by the application of a blister on the back of the neck and between the shoulders; nor could its use be dispensed with, as no other remedy would afford such effectual relief. A free evacuation of bile, by the use of jalap and calomel, when the stomach would retain them, relieved the violence of pain of the back, and abated the febrile commotion. The discharges by stool were remarkably dark coloured, putrid and offensive. From frequent observation I am induced to believe that purgatives sometimes evacuate but one portion of the intestines; as, in many cases this fall, on the exhibition of the first purge, the first discharges have been the excremental contents of the rectum, whilst the last evacuations were of yellow bile, as if immediately poured into the duodenum. A repetition of the purgative, in the course of twelve or sixteen hours, has procured a discharge of black offensive bile, to evacuate which completely has required the exhibition of a third dose. This I have explained to myself, by supposing that portion of the intestines where the bile accumulates and undergoes the putrefactive process to be thereby affected with a kind of torpor or insensibility* to the action of cathartics, unless of the drastic irritating kind, and frequently repeated: hence more beneficial effects result from the use of jalap, calomel, scammony, aloes, gamboge, resin of jalap, &c. than from those of milder operation. It may be here observed, that notwithstanding the multiplicity of cases which occurred this fall, the mortality was but small. One patient only I lost.

* In consequence of the operation of the septic acid evolved during the putrefactive process.

The complaints during the winter were mostly of the breast and lungs. Coughs and colds were generally complained of. Pleuritic cases continued to occur, frequently and fatally, until the latter part of March. April also afforded cases of the like kind; however, accompanied with symptoms of less danger. Recourse is not always had here to medical aid, in cases of supposed pleurisy, until towards the close of the disorder. Bleeding is generally prescribed and practised by the planters on the first attack of pain; but the unfortunate result, arising, in most cases this winter, from the loss of blood, tended to restrain the indiscriminate use of the lancet. Medical assistance, when resorted to, was found insufficient to repair the injuries consequent on a copious bleeding. Errors of this kind are not entirely confined to common bleeders: even physicians themselves have generally considered bleeding as indispensible in pleuritic pains, and performed it likewise without particularly attending to the pulse, by which, I conceive, they ought especially to be guided. The tense corded pulse, which characterises inflammatory fevers, does not always accompany the pneumonic affections so prevalent in this State during the winter and some of the spring months. On the contrary, many of those cases wherein the pains of the side, breast, back and head have been found excruciating, are accompanied by a low, sunken pulse, which certainly forbids the loss of blood.

I shall now proceed to the description of a fever which proved very mortal in this town and country, during the months of February, March and April. Dr. Williamson has noticed the vulgar appellation by which it is known, as also its scientific name.* His omission of a description of its symptoms I will attempt to supply from actual observation. The attack is most commonly in the night, and commences with an ague, in some instances violent and long continued, in others with a chilliness of some hours duration: before this is entirely worn off, a pain of the head, breast, side or back, seizes the patient, and frequently a concurrence of two or more. These continue to increase in violence as the fever

* From information I am led to think that the same combination of symptoms appeared on this river in the year 1789 or 1790, and was then known by the indeterminate name of influenza; the success in the treatment of which was proportionate to the means of cure: bleeding was generally fatal, whilst the use of blisters, warm diaphoretics and cordials, was highly beneficial. Some physicians of my acquaintance have this year designated it by the name of bilious peripneumony.

comes on, and during its progress. The pain is generally confined to the forehead, of a heaviness in which, and the eyes, the patient complains; a turgescence and inflammation of the vessels of the eye is apparent. In the most violent and fatal cases delirium takes place on the accession of the fever, and continues, with few intervals of reason, until the termination of the disease. The pain and oppression of the breast are such as usually accompany a peripneumony, but the pleuritic pain exhibits a degree of unusual violence. The cough is urgent, and what is expectorated is in small quantity, frothy, and intimately mixed with blood, so as to afford a mixture of a lateritious colour. The breathing frequent and laborious, and accompanied with a wheezing noise, as if from viscid phlegm in the trachea: this symptom continues to increase until the fatal period arrives. The stomach is affected with pain and distention, and a nausea and vomiting of bile, of different shades of colour, from yellow to the darkest green, take place at an early period; a diarrhœa soon succeeds, and sometimes precedes the vomiting. The discharges by stool are bilious, of a dark colour, nearly black, and emit a putrid offensive smell, more especially when procured by art. The bilious symptoms have invariably evidenced themselves from the first attack, and in those cases in which they predominated, the lumbar pain was most urgent. In the generality of patients the pneumonic symptoms did not display themselves before the third, sometimes the fourth or sixth day. The pulse was such as to forbid bleeding, and in those cases in which it was incautiously resorted to, on the supposition of its being of an inflammatory kind, the event was fatal. No certain prognosis of the period of time to which the fever would be protracted, could be formed. It might be observed, in general, that where the affections of the head and stomach were most violent, the fatal period soonest took place: where the bilious and pneumonic symptoms were predominant, it was protracted to the seventh and ninth days, and the probability of recovery was greater; whilst a bilious affection alone, or slightly combined with pneumony, lasted for twelve or fourteen days, and the danger was consequently less.*

* In one instance it terminated fatally in the course of sixteen hours, in another in sixty. These were both females of middle age. One patient, a man of robust make, 45 or 50 years of age, who died on the sixth day, was observed, for a short time before his death, to be affected with an eructation of fluid which he endeavoured to suppress; however, it continued in frequency and quantity so as necessarily to be discharged: and, finally,

Mode of Cure.—On this head I regret that I have nothing new to offer. When the attack is so violent, and the event so immediately fatal, as in the cases mentioned in the note, I conceive it is beyond the power of art to afford assistance, as an immediate destruction of the texture and functions of the brain, and a sudden putrefaction of the fluids seem to take place; however, I can with pleasure assert, that in many cases which came under my care, whose situations appeared almost irremediable, I have derived the greatest advantage from blistering, and evacuating the intestines freely of their putrid contents. The operation of the cathartics had a powerful effect in relieving the head, and likewise the breathing, which seemed to be impeded or rendered more laborious by the distention of the abdomen from an accumulation of bile. The expectoration I endeavoured to promote by lac ammon. squills, and small doses of emetic tartar; however, as in very few cases a free expectoration was formed, I did not imagine I derived much benefit from that discharge. The lungs were more relieved from the application of a blister on the region of the chest. Neutral mixtures and snake-root I made use of as auxiliary febrifuges, and think some advantage was derived from them in promoting the discharges by the skin and kidneys. The event of one case in particular disappointed me, as my prognosis on first sight was unfavourable. He was attacked early in the morning with a chilliness which continued four or five hours, during which there appeared a slight alienation of mind, which amounted to a total deprivation of reason on the accession of the fever. I saw him about 3 P. M. the day of attack: his pulse was quick, full and soft—eyes languid and inflamed—the extremities partially convulsed, together with a subsultus tendinum—respiration frequent and laborious, with a slight cough—a nausea, and frequent inclination to vomit. The putrid exhalation which filled the room was insupportable for any length of time. About 5 P. M. a spontaneous vomiting of bile came on, of a dark green colour, almost black: this continued at intervals through the night, and was assisted by thin diluents. Having a perfect knowledge of his habits of living and state of health previous to the attack, I deemed it unnecessary to administer medicine; however, I resolved to watch the issue of the night. About

the ejection of a large quantity of extremely black fluid in a curdled state, and answering nearly to the description of the matter of black-vomit, as occurring in yellow fever, closed the awful scene. These were the only deaths in town.

midnight a perspiration came on, when reason returned. The vomiting subsided as the discharge by the skin returned. About 8 A. M. a dose of jalap and calomel was administered, which emptied the intestines freely of a quantity of putrid matter. In the evening, with a return of strength, returned also an inclination to sacrifice to his favourite deity (Bacchus): he accordingly struggled to the temple, poured out his libations, and returned to his room. Although labouring still under a constant low fever, and slight delirium at intervals—laborious respiration, cough, and expectoration of frothy matter tinged with blood, he exerted himself to totter from his room three or four times a day, and procure his dose of diffusible stimulus. This course he continued until his health was re-established, with the precaution of abstaining from food until prompted thereto by a healthy appetite. Although I consider the conduct of this patient as hazardous in the extreme, I am confident it saved his life. The accurate Dr. Jackson, in his Treatise on the Yellow Fever of the West-Indies, says, "I have heard of some well attested instances, where plentiful draughts of rum and water have checked the vomiting, and apparently saved the lives of patients, after the medical people had given them up for lost."

I shall forbear theorizing on the cause and nature of this endemic, as theory sometimes bewilders both writer and reader: nor dare I insist on a particular mode of practice, as this must vary according to the nature of the fever. I am not particularly attached to any system of physic, yet endeavour to cull from all, recollecting a liberal observation of the celebrated Dr. Cullen to his pupils (of whom my preceptor was one), to this effect: "That he did not deliver his doctrine as implicitly to be adhered to by his hearers, but rather as a text on which to enlarge, or foundation on which to raise a superstructure."—I have used the lancet freely and successfully in cases of pleurisy and peripneumony, and expect so to do again, if the nature of the fever justifies its use: however, my own experience, and the communications of others, experienced medical friends, will hereafter render me more particularly cautious and observant.

Since the last of April there has been an almost entire exemption from febrile complaints.

I am, gentlemen,

With sentiments of respect, &c. &c.

G. PILLSON.

June 12, 1801.

ARTICLE VIII.

An ACCOUNT *of* FEBRILE DISEASES, *as they have appeared in several Towns in the County of Cumberland, District of Maine, from January*, 1800, *to January*, 1801: *Communicated by Dr.* JEREMIAH BARKER, *of Portland, to Dr.* MITCHILL.

IN the months of January and February, an inflammatory fever, attended with a sore throat, prevailed in several towns, among adults as well as children. Some account of this distemper is printed in the third volume of the Medical Repository, page 364.

During the months of March, April, May and June, the mumps and hooping-cough were very prevalent, frequently attended with considerable fever. The mumps was attended with painful indurated swellings in the neck, which, in some instances, terminated in suppuration. The hooping-cough was very obstinate, and often proved fatal to children under a month old.

In the month of July several cases of highly inflammatory fever occurred. The weather was unusually hot and dry. The thermometer rose to 90 several days.

On the 11th of July, a young man, of a full habit, in Cape-Elizabeth, was attacked with great pain in his head and limbs, but particularly in his legs, the muscles of which were spasmodically affected. The whites of his eyes were as red as blood. His face was purple. His thirst for water was great. Fainting fits occurred whenever he was raised up in bed. He had no chilly fits, nor disturbance in the alimentary canal. On the first day of his attack a profuse hæmorrhage issued from his nose, as also on the second and third days. After this the pain in his head and limbs, redness of his eyes, and purple colour of the face, were removed. Paleness succeeded.

The above account I had from his nurse, who supposed that he had lost a quart of blood.

On the fifth day, when I was called, the whites of his eyes, and whole body, had acquired a deep yellow hue. His urine was of the same colour. He had a quick pulse, a moist and white tongue, and considerable thirst for water.—These symptoms subsided on the ninth day, and he recovered.

Previously to his attack he had been exposed to great heat in confined air.

In the latter part of the month the fever was ushered in with nausea, vomiting, and chilly fits. Cases of this description terminated favourably, in about ten or twelve days, upon the evacuating and alkaline plan.

From the first of August to the middle of September, the *cholera morbus*, as it is termed, was remarkably prevalent in many towns, chiefly among children. Indeed, the distemper was more prevalent and malignant in this part of the country than ever it had been known to be before by the oldest inhabitant among us.

The vomiting and purging were frequent, which readily induced great prostration of strength. The matters ejected from the stomach, in the progress of the disease, were sometimes so corrosive as to excoriate the throat and mouth. The intestinal discharges were often tinged with blood, and tenesmus was frequently a very troublesome symptom. Adults, and others, who could describe their feelings, complained of great pain, heat and anguish in the stomach, and a sense of soreness upon the abdomen, which was often tense. A remitting fever, with a quick pulse, and thirst, also attended.

Two modes of practice were pursued in this disease. One mode was to exhibit cathartics, as rhubarb and calomel, castor oil, &c. followed with opiates. By these means temporary relief was obtained, and the disturbance in the alimentary canal was often considerably allayed for several days. These circumstances afforded hopes of a favourable termination. After this respite, however, the vomiting frequently returned, the contents of the stomach having acquired a dark green hue, and a great degree of virulence. The febrile disturbance increased, and a rapid decay of flesh and strength ensued; so that the patient generally expired in a short time, or the state of convalescence was very long and tedious.

The other mode of practice consisted in the administration of emetics, cathartics, alkalines and oils, as also of opiates. This mode of practice was evidently attended with much greater success.

With respect to emetics, they appeared to me to be generally indicated. Indeed, I did not think it warrantable to risk a case unless the stomach was thus cleansed. Spontaneous vomiting afforded very little relief, seldom discharging any thing in the beginning of the disease, excepting the matters taken into the stomach. An emetic, however, ejected a quantity of green matter, which repeated cathartics, upon trial, could not remove. Neither did emetics induce that degree of de-

bility which followed cathartics. On the contrary, the patient revived, and the stomach appeared to be invigorated by the operation of a suitable vomit. This was verified in many cases, even where the principle of animation was so far exhausted that the pulse could scarcely be felt.

With a view of rendering an emetic still more efficacious, I adopted a practice of working it off with an aqueous solution of alkaline salts. Four or five grains of sal. absynth. were accordingly given to a child of two or three years old, in warm water, immediately after each discharge by the vomit; and fifteen or twenty grains to an adult.

These alkaline draughts served, as I conceived, to obtund or neutralize the virulent matter in the stomach, and disarm it of its corrosive power; for by this means the anguish at the stomach more readily abated, and the matters ejected became much less offensive. In not a single instance did the vomiting return when the stomach was cleansed in this manner—cases of relapses from improper food excepted; but when an emetic was administered in the usual way, the vomiting frequently returned.

The speedy and radical cures which were effected by seasonable emetics, worked off with the alkaline solution, induced me to place great confidence in this mode of procedure.

When the stomach, however, was not seasonably and properly cleansed, the virus of the disease soon extended its baneful effects beyond the alimentary canal, producing febrile disturbance and thirst; and, in some instances, a very sore mouth.

Under these circumstances, the stomach and intestines being previously evacuated, alkaline salts, absorbent earths, lime-water and oils, as also alkaline enemas, were productive of the happiest effects: for, under a liberal use of these articles, many severe cases terminated favourably, while, among others, apparently much milder, in which these remedies were omitted or neglected, the disease often proved fatal. Such neglects were frequently occasioned by the inattention of nurses, or difficulty of exhibiting these articles to young children.

After the virus of the disease was so far subdued, by these means, that the anguish at the stomach, and fever, had abated, opiates and other stimulants were employed to advantage; but while the morbid stimulus continued to exert its deleterious power to any considerable degree, stimulants were generally offensive to the stomach, and evidently excited the fever.

The food most congenial to the stomach, during the disease, was Indian gruel and rice. Cold water was the most desirable drink, and always afforded great refreshment. In the convalescent state, salted pork was eaten with impunity, and proved to be agreeable nutriment. Fresh beef, however, produced relapses in several instances, exciting vomiting, purging, and febrile disturbance. The matter ejected from the stomach was of a dark green colour. The stools were of a similar hue, and very fœtid. The abdomen was tense, and the fever, as well as thirst, was considerable. In some of these cases medical aid was interposed in vain. Alkalines, however, had astonishing effects. They seemed to put a stop to putrid fermentation in the alimentary canal as readily as they do in any other receptacle of putrescent matters, and removed the fœtor; so that, when the patient was not too greatly exhausted, or a lesion of organs had not taken place, recoveries, by a liberal use of these means, were effected.

From the middle of September to the first of November a low remitting fever prevailed, attended with cough, and a copious expectoration of matter. When medical aid was not seasonably called, the fever was frequently protracted to thirty or more days. In some of these protracted cases the disease proved fatal. But when seasonable assistance was called, and alkaline remedies were duly employed, the fever gradually subsided, and ceased in twelve or fourteen days. The appetite then returned, by the use of tonic bitters, and the patient recovered.

During the months of November and December general health prevailed.

A few cases and remarks will close this account.

On the 2d of August, a child, in a country village, two years old, was attacked with the usual symptoms of a mild cholera, and managed wholly by its nurse. Occasional doses of rhubarb, as also of elixir paregoric, were given. The child remained in a pretty quiet state for several weeks. On the 10th of September I was called, and found the patient emaciated to a mere skeleton, labouring under a low remitting fever, cough, and a very sore mouth. The stools were frequent, and of a dark green colour. The patient died a few days after.

In many cases of this kind, where the poisonous cause was not counteracted, the disease proved fatal.

On the 10th a middle aged man was attacked, in the evening, with great pain, heat and anguish in his stomach. I was

called in the morning, and found him greatly exhausted. He had vomited, as he said, more than twenty times, and purged as often. His stools were very slimy, and considerably tinged with blood. I gave him an ounce of olive oil, and thirty drops of laudanum, which alleviated his pain in some measure, and checked the discharges. In about six hours, however, the vomiting and purging returned; the pain increased, and he became feverish and thirsty. His abdomen was very tense, with a sense of soreness. I then gave him two grains of tartar emetic, which operated six times; and an aqueous solution of alkaline salts was given after each of the vomitings. The tension of his bowels, and other symptoms, then subsided; so that the next day he was able to walk abroad.

I met with many very similar cases among children as well as adults; and when an emetic was given within twenty-four hours from the attack, and conducted in this manner, the disease was generally eradicated without the use of any other means.

On the 12th a child of three years old was seized with severe cholera. I was called on the third day. The vomiting and purging had been frequent from the attack. The pulse was very quick, and the thirst great. After cleansing the stomach with ipecacuanha, worked off with the alkaline solution, the discharges ceased, but the quickness of the pulse and thirst continued. Four grains of sal. absynth. and twenty of creta, were then given, once in two hours, and an ounce of lime-water as often. The fever and thirst ceased in three days, and the appetite returned. Eight days after the child suffered a relapse, in consequence of eating fresh beef, and the vomiting, as well as fever, returned. The abdomen was tense, and the stools were very fœtid. By a renewal, however, of the alkaline remedies, the complaints were soon removed, and the patient recovered. Several other cases of relapses, in consequence of eating fresh meat, occurred; and when alkalines were not exhibited, the putrefactive process in the alimentary canal soon destroyed life.

On the 8th of September I was called to a young man, of a full habit, in Cape-Elizabeth, who complained of a pain in his head and back, as also of drowsiness. The whites of his eyes, and whole body, were of a deep yellow colour. His tongue was white, and he was thirsty. His pulse was full, though not much quicker than natural. His bowels were costive, and he disrelished every kind of food. The preceding day, as his nurse informed me, his face was remark-

ably red, and his thirst great. A pint of blood was drawn, and his pains were alleviated. His stomach and intestines were evacuated, and a blister was applied to his neck. Alkalines were prescribed, as also calomel.

As the disease advanced his drowsiness increased; so that, after the fifth day, he did not incline to open his eyes, speak or move. A low delirium succeeded; and, on the seventh day, he was attacked with hiccough. His stools, at this time, were very black, fœtid, and involuntary; and his skin had acquired a copper colour. On the eighth his respiration became laborious, and on the tenth he expired.

Very little medicine was exhibited during his sickness, on account of a suspicion, which the nurse entertained, of the disease being catching.

Three days before the accession of these symptoms he was exposed to the effluvium of raw hides, in a state of putrid fermentation, which excited nausea and vomiting. These hides were brought from the West-Indies to Bath, on Kennebeck River, packed in casks, and opened upon a wharf. Four other men, who assisted in unpacking these hides, and two women, who happened to be near, suffered a very similar attack, as I have been informed by their attending physician. Some of these patients, however, he observed, were attacked with violent and continued vomiting, quick and disturbed pulse, as well as with a yellow skin. Four of these patients died. A man who washed the clothes of the deceased at Bath was also attacked with very similar complaints, and died.

It is worthy of remark, that from none of these patients in yellow fever has the disease been communicated.

On the 12th I was called to a young man who was attacked, eight days before, with the usual symptoms of cholera. His vomiting had ceased, but the diarrhœa continued. He complained of great uneasiness and anguish at the stomach. He was affected with a remitting fever, quick pulse, and hurried respiration. His tongue was unusually red, and he was very thirsty. Two grains of tartar emetic were now given, which ejected, by vomit, dark green matter of a very offensive smell, although he had taken several cathartics. He vomited several times, and the alkaline draughts were exhibited as usual. His stomach and lungs were then greatly relieved. After this, twenty grains of sal. absynth. with thirty grains of calcined oyster-shells, were given once in two hours, and two ounces of lime-water as often. The febrile disturbance

gradually subsided, and ceased in five days. His appetite soon returned, and he recovered.

In some cases, where the degree of putrid fermentation in the alimentary canal appeared to be greater, and where the febrile cause had become more concentrated or virulent, the alkalines were given in larger quantities with impunity, and evidently to very great advantage.

In tenesmus, which sometimes greatly molested the patient, I directed alkaline salts in clysters, and they readily afforded relief.

Besides the beneficial effects derived from the use of alkaline remedies in febrile diseases, I have, for a few years past, found them to be of singular efficacy in certain surgical cases, as well as in other maladies.

Six years since, a peasant, in a neighbouring town, was afflicted with painful cancerous tumours in his face, which discharged a very corrosive humour. Several of these tumours were extirpated with the knife; and mercury was employed, both externally and internally, as well as cicuta, with a view of correcting this humour, and of disposing the sores to heal. The sores, however, would not heal upon this plan. Indeed, the humour increased in degree of virulency and corrosive power, notwithstanding that the external applications were reinforced with vitriols, lead, various unguents, and even *arsenic*.

He remained for a considerable time in this forlorn condition—laid aside all means, and considered his disease as irremediable.

I then directed a strong lixivium of wood-ashes to be applied. This readily stopped the progress of the corroding humour, alleviated his pains, and allowed the sores to heal. By this mean the cancerous humour was subdued, and rendered harmless; so that, in a short time, the ulcers healed, and a radical cure was effected.

Since this event, it has become a common practice, in this part of the country, not only among physicians, but others, to eradicate cancers, with a strong solution of pot-ash, as well as with the lixivium of ashes.

This lixivium is made by boiling a gallon of common ley down to a pint. A dossil of lint, impregnated with this ley, and applied to the cancerous tumour, soon alleviates the pain, and converts it into a black lump, which, by a common digestive poultice, readily separates from the sound flesh. The sore then heals by a simple dressing.

In the course of my practice, several cases of mortification or gangrene, chiefly of the extremities, have occurred. The disease was first manifested by a small painful tumour of a dark crimson colour. The part soon swelled to a considerable degree, and the anguish extended, in red streaks, to the body. The vital functions then became affected, and life readily escaped, notwithstanding that cataplasms, fomentations, vinegar, lead and opiates were employed, as also depletion.

The last fatal case which came under my notice was in August, 1795. The complaint took place on the lip, which soon swelled to a considerable degree. The whole face also became tumid, and acquired a livid hue. The throat and vitals then became affected, and death took place in ten days from the attack. In this case there was a small pimple upon the lip, which was irritated the day before the pain and anguish took place.

I have lately met with two cases of these painful tumours upon the fingers, where the parts had sustained no injury. The anguish soon extended above the elbow, assuming a formidable appearance. In these cases I directed the lixivium of ashes to be applied. By this mean the pain and anguish soon abated, digestion took place, and the disease was removed.

About two years since, a seaman, in this vicinity, who had been exposed to noxious air, and fed with bad provisions, in the West-Indies, was afflicted with corroding ulcers in his legs. A very similar mode of practice was pursued, which was first adopted in the cancerous case of the peasant. No benefit, however, was experienced by this mode, although it was persisted in for nearly twelve months. This patient also despaired of a cure; but, accidentally meeting with a physician from the State of New-York, he was directed to wash his legs with an aqueous solution of pot-ash, and to make a liberal use of the same internally. By this mode of practice the ulcers healed in a few weeks, and his legs were restored to soundness.

Three years ago, a man who had been troubled with rheumy eyes, and inflamed eye-lids, for nearly twenty years, applied to me for advice. He had employed the common eye-waters of vitriols, lead, &c. but to no benefit. I directed him to make use of pure lime-water as a collyrium. This, in a few weeks, removed the disease, which has never, as yet, returned. Since that period I have generally prescribed this article as a collyrium, and find it to be much more efficacious than any other remedy I have heretofore used.

I have employed alkaline remedies in several cases of *scrophula*, both externally and internally, to very great advantage.

A physician in Portland informs me that he has lately cured a violent *erysipelas* by a lotion of an aqueous solution of alkaline salts, and with surprising quickness.

Venereal chancres have easily been cured, by me and some of my brethren, with alkalines; and *gonorrhœa virulenta* has readily been removed by injections of these articles.

The successful treatment of these cases with alkalines appears to me as but a prelude to the great improvements which will, in future, be made in the art of surgery, by a free and extended use of similar applications.

ARTICLE IX.

A Case *of* Epilepsy, *in which* Argentum Nitratum *was successfully exhibited: Communicated by* L. J. Jardine, *M. D. of Philadelphia, to the Editors of the Medical Repository.*

Philadelphia, July 4, 1801.

Gentlemen,

In August last I was desired, by a gentleman who resided about six miles from this city, to visit one of his servants, a white boy, ten years of age, who was much afflicted with epileptic fits. When I visited him I recollected that, during my attendance in the family a short time before, I had noticed a peculiarity in his countenance and manner, which appeared to me to be the effect of natural imbecility of mind. Upon inquiry, I was informed that, previously to the attacks of epilepsy, no such defect had existed, but that he had always discovered as much smartness and intelligence as boys of his age usually do; that the first fit took place in the preceding spring, without any *apparent* exciting cause; that this was followed by several others at very irregular intervals, and that his mind was obviously much debilitated by every paroxysm.

Being fully satisfied that, in many diseases, the operation of stimuli is rendered much more efficacious by previous depletion, I took from him eight ounces of blood, ordered him a

cathartic, and directed spare diet for a few days. I then prescribed stramonium, with a return to his former diet. The stramonium could not be procured; which, on reflection, I did not regret, as it has been observed, that in those cases of epilepsy in which the *mental powers* are much affected, this medicine is administered with little or no advantage. I then had recourse to the nitrate of silver, a preparation which has been proved, by the experiments of Dr. Cappe, of York, to possess a most extraordinary influence both upon the nerves and muscles. For the first week he took half a grain twice a day, and afterwards two grains per day for about two months. During the two first days the medicine produced a purgative effect, which spontaneously subsided. About three weeks from this time he had a fit which, in violence and duration, much exceeded all his former ones; and, in one week after this, another somewhat less violent. Experience having proved, that during the use of this remedy, the aggravation of the disease, at first, is almost a certain prelude to its total removal, I was induced, by those two violent attacks, to prognosticate a favourable event. Shortly after the last paroxysm which I have mentioned, a visible improvement took place in his countenance and general system, and his medicine was, without my advice, soon discontinued. Upwards of ten months have elapsed since his last fit, and he now exhibits the appearance of the most perfect health, both of body and mind.

With the strongest wishes for the success of your valuable Repository,

I am, Gentlemen,
Your obedient, humble servant,
L. J. JARDINE.

ARTICLE X.

OBSERVATIONS *and* EXPERIMENTS *relating to the* PILE *of* VOLTA: *In a Letter from Dr.* J. PRIESTLEY *to Dr.* WOODHOUSE, *Professor of Chemistry in the University of Pennsylvania.*

DEAR SIR,

HAVING been favoured, by Mr. Weatherby Phipson, a young man of Birmingham, with an excellent apparatus for repeating the experiments on the *pile of Volta*, consisting

of sixty plates of copper coated with silver, and as many thin rolled plates of zinc, which is a valuable improvement of his own, I have had great satisfaction in observing the results; and though (receiving intelligence of what is doing on the continent of Europe so late as I do here) it is probable that I shall be anticipated in my observations, I shall lay them before you, after observing that I have received the fourth volume of Mr. Nicholson's *Journal*, but am ignorant of all that has been done since the publication of it.

I cannot help expressing my admiration of the ingenuity with which many persons have pursued this most curious subject; and, in general, my results are the same with theirs, though I draw different conclusions from them, especially with respect to the modern hypothesis of the *decomposition of water*, which, though almost universally received at present, I consider as wholly chimerical, and unable to stand its ground much longer. Indeed, I perceive that doubts are entertained concerning it by several persons, and others observe that these experiments give no support to it. To me it is evident that they are very far from doing so: for though it may happen that the inflammable air, from the wire connected with the silver end of the pile, be in the proportion to the dephlogisticated air from the wire connected with the zinc end, which that hypothesis requires, it appears that the latter comes from the air that is merely held in solution in the water in which the process is made; since if, by means of oil upon the water, or a vacuum, access to the atmosphere be cut off, the whole production of air ceases. There is also no production of air when the water has been exhausted of it; and certainly no good reason can be given why, if the water itself consists of these two kinds of air, and this process be capable of decomposing it, air should not be produced from it in all these cases; both the constituent parts of the water being present, and the power of separating them being in full operation. Besides, I find that though the two kinds of air be produced, they are not always in the proportion required by the new theory, the dephlogisticated air being much less than is requisite. I have also found it not much better than atmospherical air. The inflammable air I believe to be of the purest kind.

If this inflammable air came from the decomposition of the water, the water from which it is extracted ought to contain an overplus of oxygen, either in the form of dephlogisticated air, or of acid. But the signs of acidity bear no proportion to the quantity of inflammable air produced, and can

hardly be perceived at all. I did perceive it when I made the process in water tinged with the juice of litmus, but only by the redness of the froth from the wire connected with the zinc end of the pile, the liquor itself remaining unchanged, notwithstanding a copious production of inflammable air from the other end of the wire. Also, when I introduced a piece of raw flesh instead of the metal connected with the zinc end of the pile, no air came from it; nor did I perceive that the surface of it had acquired any acidity, though inflammable air was produced in great plenty from the other wire.

But, except gold or platina be connected with the zinc end of the pile, there is seldom any production of air from that quarter, the metal in that situation being dissolved; and there is no appearance of its being dissolved by any *acid*, but, on the contrary, of its being supersaturated with phlogiston. But before I produce the evidence of this, which affords an argument against the decomposition of water that appears to me to be perfectly decisive, I shall relate some circumstances concerning this solution of metals which I do not find to have been noticed by others.

In general, wires connected with the zinc end of the pile are dissolved, but none so readily as those of silver, even when the wires connected with the silver end of the pile are of the same metal, and give air copiously. But if zinc or iron be connected with the silver end of the pile, any other metal except gold or platina, connected with the zinc end, will be dissolved. Iron and zinc were the means of dissolving each other. But the surest method of producing this solution of metal was by connecting charcoal with the silver end of the pile. I once dissolved pure gold in this manner, and I preserve the solution as an evidence of it; but I could never do it a second time, though I tried charcoal in several states, perfect and imperfect, &c. nor could I by this process dissolve platina.

Charcoal itself is not sensibly dissolved in this process, and air comes from the pieces connected with both ends of the pile. Suspecting that this air might be that which always comes from charcoal when it is plunged in water, I filled the pores of two pieces of it with water, by means of the air-pump, leaving them a long time in vacuo. Being then tried, they gave no air for some hours; but from the piece that was connected with the zinc end of the pile there proceeded a white cloud which filled part of the vessel of water: this, however, soon disappeared, the water becoming transparent

again; and, after some hours, both the pieces of charcoal gave air as copiously as any of the metals had done, and continued to do so as long.

When iron was connected with the silver end of the pile, and copper with the zinc end, the latter was dissolved, but not till after two or three hours. Zinc being connected with the silver end, and copper with the zinc end, the former gave air copiously from the beginning; but it was near two hours before the copper began to dissolve, which being a flat piece, it did at the corners and edges only, and never from any part of the flat surface. When I added more copper it began to give air without dissolving; and also some of the green precipitate, which had been formed before, gave out air, and the bubbles adhering to it rose from the bottom of the vessel to the top. This precipitate from the copper, which at first was green, became afterwards of a dark brown, as if the metal had been revived. This too was the case with one vessel in which a solution of silver had continued some time. It has given a coating to the glass that is perfectly white and brilliant.

Having introduced four vessels of water between the two ends of the pile, and having connected each two with silver wires, that leg of the wire, in all the vessels, which was next to the silver end of the pile, gave inflammable air, while, in all of them, the other leg of the same wire was dissolved. When I covered one of these vessels with oil, the production of air, and the solution of the wires, ceased in them all.

Though, as I have observed, there was a slight appearance of acidity in the water when dephlogisticated air was given out at the wire communicating with the zinc end of the pile, there never was the smallest appearance of it when the metal was dissolved. When silver was dissolved in water tinged with the juice of litmus, and there was a copious production of inflammable air from the opposite wire, I could not perceive the least change of colour in the water.

I examined the water in which the process was made, especially when silver was dissolved in it, but was so far from finding the air contained in it more pure than before, it was evidently less so. Before the process, the standard of this air, with an equal quantity of nitrous air, was 1.1; with the water made turbid and white with a solution of silver, it was 1.2; and, after standing till it became black, it was 1.3.

The black matter from this solution of silver did not contain any oxygen, but was evidently the metal supersaturated

with phlogiston; for when it was heated in dephlogisticated air it diminished it, and converted part of it into phlogisticated air; and when it was heated in inflammable air it added to the quantity of it; and this appeared, by its explosion with dephlogisticated air, to be as pure as other inflammable air; so that this black powder of silver is similar to the black powder of mercury made by agitation in water, which I have shown to be mercury supersaturated with phlogiston. Where, then, is the oxygen that ought to be produced in great quantity, if the inflammable air from the wire connected with the silver end of the pile came from the decomposition of the water?

The glass vessels in which silver has been dissolved in these processes are tinged of a dark colour, which no acid, nor any other menstruum that I have applied, will take out. This is similar to the case of flint glass becoming black by heating inflammable air in it; the calx of lead in the glass uniting with the phlogiston of the air. In this case, therefore, it is natural to infer that this calx of silver imparts phlogiston to the glass, and that there was nothing of oxygen in it. The surface of this black powder of silver, long exposed to the air while it is moist, becomes white, which is similar to the experiment with mercury, in which the black powder of this metal, produced by the agitation of it in water, becomes white running mercury as it becomes dry, diminishing and phlogisticating the air in which it is confined.

The black calx of silver, made by its solution in nitrous acid, is said, by Mr. Macquer, in his Dictionary, to be owing to the phlogiston contained in that acid. To ascertain this I dissolved some pure silver in spirit of nitre, and, evaporating the solution, I heated the residuum in thirteen ounce measures of dephlogisticated air, of the standard of 0.82, with two equal quantities of nitrous air, by which it was reduced to eleven ounce measures, of the standard of 1.72, with one measure of nitrous air; so that it was almost wholly phlogisticated air: consequently this calx of silver contains no oxygen.

My present opinion concerning the theory of this curious process is as follows:—Since the operation wholly depends on the calcination of the zinc, which suffers a great diminution of weight, while the silver is little affected, and all metals lose their phlogiston in calcination, what remains of the zinc in a metalline form in the pile, and every thing connected with that end of it, is supersaturated with phlogiston; while the

calcined part, and every thing connected with that end of the pile, is deprived of it. The former, therefore, is in a *positive* state, and the latter in a *negative* one, with respect to phlogiston; and it seems to follow, from these experiments, that this is the same thing with positive and negative electricity; so that the *electric fluid* and *phlogiston* are either the same, or have some near relation to each other. The silver seems to act principally as a conductor of electricity: for the surface of it is only blackened in some places in this process, in consequence, probably, of receiving phlogiston from the zinc; but the water is most essential to it; because it constitutes the principal part, if not the whole, of the addition of weight in the calx. Accordingly, in the calx of zinc I have found nothing but water, though it is probable that there is a small portion of oxygen in it.

These experiments favour the hypothesis of *two electric fluids*, the positive containing the principle of oxygen, and the negative that of phlogiston. These, united to water, seem to constitute the two opposite kinds of air, dephlogisticated and inflammable.

These experiments tend likewise to confirm the conjecture which I advanced in my first publication on the subject of air, concerning *the similarity of the electric matter and phlogiston;* and, together with the proper Galvanic experiments, show that the same substance, elaborated from the aliment by the brain, is the cause of muscular motion, the nerves being the most sensible of all electrometers. See the first edition of my *Experiments on Air*, vol. i. p. 274, &c.

I see no occasion to suppose, with Mr. Volta, that there is any *circulation* of the electric fluid in this pile. The calcination of the zinc supplies phlogiston as long as it continues, and when that ceases the operation of the pile ceases with it. I also see no necessity that one end of the pile should be silver and the other zinc; and when both are silver, or both zinc, the operation is the same; nor can I conceive why it should be otherwise. When the pile is properly prepared, the addition of any kind of metal to the ends only serves as a conductor of the electric fluid, and silver, zinc, or any other metal, will sufficiently answer this purpose.

Had this process succeeded without any atmospherical air incumbent upon the water in which it is made, it would have amounted to a full proof of the new theory; one part of the water being deprived of hydrogen, while oxygen abounded in the other, and both of them, with the assistance of *calo-*

ric (though it does not appear whence that could be supplied), assuming the form of air. But this not being the case, the element of the dephlogisticated air evidently coming from the superincumbent atmospherere, the element of the inflammable air must necessarily come from the calcined metal, which is a sufficient proof of the doctrine of phlogiston. Whether in this you will agree with me, or not,

I am, dear Sir, yours sincerely,

J. PRIESTLEY.

Northumberland (Penn.), Sept. 16, 1801.

P. S. In Nicholson's *Journal*, vol. iv. p. 326, it is said, that "the inventor of the Galvanic pile discovered the conducting power of charcoal;" whereas it was one of my first observations in electricity, made in 1766, and published in the first edition of my *History of Electricity*, in the year following. See that edition, p. 598.

Having, since the above was sent to the Medical Repository, covered the whole pile with a large receiver standing in water, when charcoal was connected with the silver end, and silver (in two vessels of water) with the zinc end, I observed that the air within the receiver began to diminish; and, after about a day and an half, the diminution was at its maximum; when I examined it, and found it completely phlogisticated, not being at all affected by nitrous air. This experiment, added to the preceding on the *black calx* of the silver, and the *water* in which it is made, completes the proof of there being no decomposition of water in this process, and strengthens the argument in favour of the doctrine of phlogiston.

Sept. 29, 1801.

ARTICLE XI.

An ACCOUNT *of a* NEW, PLEASANT, *and* STRONG BITTER, *and* YELLOW DYE, *prepared from the Stem and Root of the* XANTHORHIZA TINCTORIA, *or* SHRUB YELLOW ROOT; *with a Chemical Analysis of this Vegetable: Communicated by* JAMES WOODHOUSE, *M. D. Professor of Chemistry in the University of Pennsylvania, &c.*

THIS shrub is called Xanthorhiza from the Greek words Ξανθος, *flavus*, and Ῥιζα, *radix:* it is denominated *simplicissima* by Marshall, from the supposed simplicity of its

stem. L'Heretier has given it the name of *apiifolia*, as he thought the leaves resembled those of parsley or celery; and it was formerly called *Marboisia tinctoria*, by Mr. William Bartram, in honour of M. de Marbois, an encourager of the science of Botany, and from its qualities as a dyeing drug.

As the stalks of this plant sometimes bear five branches, the specific name of *simplicissima* cannot be very proper, and its leaves do not sufficiently resemble those of parsley or celery to be called apiifolia. Xanthorhiza tinctoria is a more expressive name than any it has yet received.

The Xanthorhiza tinctoria is a native of North-Carolina, and was first brought from that State into Pennsylvania, about forty years since, by Mr. John Bartram, then Botanist to the King of Great-Britain, and planted in his garden at Kingsess, in the county of Philadelphia, where it has continued to flourish in a most luxuriant manner. The stems reach the height of three feet, and are generally somewhat thicker than the barrel of a goose-quill. The root is from three to twelve inches long, and about the diameter of a man's little finger, sending off numerous scions, sometimes two feet in length, by which means it spreads considerably. The leaves are placed alternately, having long petioles and pinnated, terminating in an odd one; the folioles sessile, and lacerated deeply on their edges. The peduncles are branchy, and are placed immediately beneath the first leaves, from which cause the flowers appear before the leaves, very early in the spring.

The Characters of the Fructification according to the Linnean Arrangement.

Cl. Pentandria Polygynia.

Cal. Perianthium, none.

Corol. Petals five, equal, lanceolate, spreading, open and flat. The nectarium forms a little crown in the centre of the corolla, composed of five little bipartite leaves, one of which is placed between the base of each petal.

Stam. Five, slender and short, placed about the middle, at the base of each petal. The anthers roundish.

Pist. Germina numerous; uniting at their base; becoming smaller upwards; forming as many subulated incurved styles, each terminated by an acute stigma. These germina become as many capsules, of a figure nearly oval and compressed, enlarging upwards, and diverging from each other; all united below on the general receptacle; each containing a single roundish seed.

The stem and root of the Xanthorhiza are of a bright yellow colour, and possess a strong bitter taste.

The following experiments were made with different parts of the plant, to ascertain its virtues.

1. Pump-water, digested on the stems and roots in coarse powder, received a yellow colour, and tasted bitter.

2. Water, repeatedly boiled on the stems and roots, extracted the greatest part of the colouring matter.

3. The stems and roots, distilled with a gentle heat, produced some water, which contained none of the qualities of the plant.

4. One pint of alkohol, digested on half an ounce of the bruised roots, contracted a deep yellow colour, and possessed an intensely bitter taste.

5. This alkohol being filtered, gave, by spontaneous evaporation in the open air, two scruples of a yellow resinous extract.

6. One pint of alkohol and water, digested on half an ounce of the bruised roots, received a pale yellow colour.

7. This diluted alkohol, evaporated to dryness, left thirty grains of extractive matter.

8. Water, added to the tincture of the stems and roots in alkohol, rendered it muddy.

9. Pieces of silk, cloth, flannel, cotton and linen, were boiled in a decoction of the powdered stems and roots. The silk received a bright yellow colour, the cloth a drab, the flannel a pale yellow, and the cotton and linen would not take the colouring particles.

10. This silk, cloth and flannel, were exposed, twenty days, to the action of the solar light, in a temperature varying from 105 to 115 deg. of Fahrenheit's thermometer, along side of other pieces of the same kind of stuffs, dyed with fustic, saffron, and turmeric.

In a few hours the light and oxygen of the atmospheric air altered all these colours a little, except that of the cloth. The colouring matter of the turmeric first disappeared, then of the saffron—that of the Xanthorhiza stood nearly as well as the fustic.

11. Pieces of silk were boiled in the following mordants: Solution of alum; alum and pot-ash, or sulphate of pot-ash and alumine; cream of tartar and alum, or tartrite of alumine and sulphate of pot-ash; saccharum saturni and alum, or sulphate of lead and acetate of alumine; and the murio-sulphate of tin. They were then dyed with the Xanthorhiza, and re-

ceived different shades of yellow. Other pieces of silk were also boiled in the same kind of mordants, and dyed with quercitron bark, weld, fustic, turmeric, saffron, and the roots of hydrastis canadensis, the simple tincture of which imparts to silk a rich and superb yellow colour. The whole were exposed to the light of the sun, in atmospheric air, twenty-seven days, in a temperature varying from 100 to 115 deg. of Fahrenheit. The colouring matter of the turmeric and saffron was the most fugitive. The silk dyed with quercitron bark, with saccharum saturni and alum, for a mordant, stood best. The others contracted a brown cast, except the weld, which had faded.

12. A portion of the roots grated, mixed with a small quantity of water, strained through a rag, and evaporated to dryness in the shade, produced a yellow extract, which was mixed with a portion of alum.

13. Paper was coloured yellow with this preparation, and green by mixing it with Prussian blue. This paper was exposed to the light of the sun in a temperature of 105 deg. of Fahrenheit, along side of other paper, stained in a similar manner with gamboge. In a few hours the yellow and green of the Xanthorhiza were considerably altered for the worse, while those of the gamboge were not affected.

14. The leaves, stem, and roots, separately burnt in the open air, yielded ashes, to which warm water was added. The water being filtered, and evaporated to dryness, produced a small quantity of pot-ash. Some silicious and aluminous earth remained on the filter.

15. A handfull of the leaves, exposed three hours to the influence of the solar light, in forty ounce measures of pump-water, gave twelve drachm measures of oxygen gas, which devoured nearly three equal measures of nitrous air.

16. A green tincture of the leaves in alkohol was exposed in a dark place, and to the light of the sun, in atmospheres of oxygenous, azotic, and hydrogen gases. That which was placed in the oxygen gas, in the light, in a few days contracted a yellow, and afterwards a red colour. No alteration was produced in the rest.

17. A stem, two feet long, was placed in a solution of nitre, and of the sulphates of iron and copper. All these agents were taken up by the absorbents of the plant, and deposited in the leaves. The iron was detected by placing the stem in the distilled acid of the unripe fruit of the Diospyros Virginiana, or persimmon tree; the copper, by putting it in

ammoniac, when the leaves were turned of various shades of brown. The presence of the nitre was shown by setting fire to the leaves, when they burnt like paper soaked in a solution of this salt.

It appears, from these experiments, that the Xanthorhiza tinctoria contains a gum and resin, both of which are intensely bitter; the resin being more abundant than the gum. From the small quantity which is obtained from half an ounce of the stem and root, by one pint of alkohol, it is probable that part of it is carried off in the vapour of this volatile fluid.

It imparts a drab colour to cloth, and a handsome yellow to silk, but the dye will not take on cotton or linen, as the colouring particles have no elective attraction for these stuffs. The different mordants which were used altered the shade of the yellow colour considerably, but did not appear to render it more permanent. While every shade of this elegant colour can be obtained from that truly valuable dyeing drug, the quercitron bark, I think it will always supercede the Xanthorhiza, and every other native yellow dye, among which that of the hydrastis canadensis may justly be reckoned the most superb.

The watery extract of the grated roots, mixed with alum, and added to Prussian blue, was first used by Mr. James Bartram, for colouring plants, and the plumage of birds, of a green colour. The green is far more lively and elegant than that made with gamboge and Prussian blue, which is generally used for painting in water colours, and stands well in the shade, but soon contracts a dull colour when exposed to a bright light, and to a high temperature. Various subjects, coloured by this green, one year since, and inclosed in a book, are as lively at this time as when first painted.

The leaves, exposed in pump-water to the light of the sun, afforded air of a high degree of purity. This air arises from the decomposition of the carbonic acid which is contained in most water. The carbon of this acid unites to the leaves, while its oxygen is set at liberty. As no pure air can be obtained from these, or any other leaves, in distilled river, rain or lime water, and as, from numerous experiments, I never could find that they purified common atmospheric air, when inclosed in it, and exposed to the light of the sun, unless it contained fixed air, I believe the opinion which is almost universally adopted, that they give to man oxygen gas in any considerable quantity, and that he yields them *azotic* air in return, to be totally false.

The colour of the leaves appears to reside in a resin, which is altered by the combined action of light and oxygen, by either of which, separately, it cannot be affected. Vide experiment 16.

Nitre, the sulphates of iron and copper, ammoniac, and the gallic acid, were taken up by the absorbents of the stem, and carried to the leaves. The hyperoxygenated muriate of pot-ash is an excellent agent to demonstrate these vessels in the leaves of some trees, as those of the Franklinia alatamaha, Corylus avellana, &c. when they become of a deep brown colour. When a leaf of Liriodendron tulipifera was impregnated with nitre, and set on fire, it burned principally along what have improperly been called the nerves of the leaf, but which are now known to contain absorbent vessels.

As the Xanthorhiza tinctoria is a strong and pleasant bitter, and very nearly allied to the celebrated columbo root, it promises to become a valuable addition to the American Materia Medica. It is preferable to all our native bitters. The bark of the root of the Aristolochia sipho, or Dutchman's pipe, which is often made use of by the inhabitants near Pittsburgh, is a weak aromatic bitter. The root of the Actea racemosa, black snake-root or rich weed, is a nauseous bitter. The bark of the root of the Liriodendron tulipifera, tulip or poplar tree, is more pungent and aromatic than bitter. Chironia angularis, or centaury; Gentiana saponaria, or blue gentian; Veratrum luteum, or devil's bit; the red berries of cornus florida, or dog wood; and the bark of several species of Salix, or willow—are weaker bitters than the yellow root.

I have often used the powdered stem and root of the Xanthorhiza with success, in the dose of two scruples to an adult, in many of those diseases in which bitters are recommended, but generally combined with other remedies. It is a medicine which sits easy upon the stomach, and produces no disagreeable effects.

References to the Plate.

A. A branch representing the foliage, flowers and fruit of the Xanthorhiza tinctoria.

a. A flower somewhat magnified.

b. A branchy peduncle, showing the capsules.

c. A capsule.

d. A capsule open, showing the single seed.

e. A seed.

f. A portion of the root, sending off a scion.

Xanthorhiza tinctoria.

REVIEW.

ART. I. *Considerations on the Substance of the Sun. By* Augustus B. Woodward. 8vo. pp. 90. *Washington.* Way *and* Groff. 1801.

IN England the name of Woodward is well remembered as having belonged to a man who, among other matters, was an indefatigable searcher into the structure and constitution of fossils and minerals, and a respectable theorist of our earth, the principal part of whose bulk is made up of such bodies. In America we find the same name associated with a bolder enterprise. The Woodward of the nineteenth century, standing upon the ground explored by his predecessor, elevates his views above terrestrial objects, and attempts to philosophize upon the great centre round which the globe we inhabit, and the other planetary spheres, revolve—the sun himself.

On reading the title-page of this piece, we were at first somewhat startled at its novelty, and felt a degree of apprehension, that, on perusal, we should find a train of visionary and fanciful notions, like many others which have been indulged on the same subject. But the examination of its contents has satisfied us that our forebodings were groundless. The author not only possesses a large share of talents, but also skill in their management and direction. His learning gives him an elevated rank among the scholars of his country, and his genius places him in the society of her inventive sons. He is well endowed with the power of comprehension, and with the additional faculty of selecting and combining ideas in a clear and logical manner. He seems to have made himself master of what has been advanced on the subject by the ancients and moderns, before he began to think for himself; and has thereby been enabled the better to give a display of his own opinions, distinct from those of his predecessors. It would be honourable to our nation if such proofs of abilities were more frequent.

Indeed, it is not to be expected, that in so arduous and intricate an inquiry the author could make all difficulties vanish before him. He could not visit the resplendent luminary of which he treats, and travel from one of his poles to the other.

It was not in his power to determine, from actual examination, whether his body consists of rocky and earthy strata, after the manner of the planet we tread upon. Nor could he even soar, on Dedalean wings, so near to the sun as to distinguish what his atmosphere and his surface offer to the eye within the limits of distinct vision. But, considering the sun as the source of electricity, of light, and, indeed, of heat, to the world we inhabit, he thought it allowable and possible to reason upon certain of their phenomena here, in such a manner as to aid us in understanding the constitution of that distant orb whence they proceed. As these three agents exist abundantly in the body of our planet and its atmosphere, Mr. W. supposes that the facts known concerning them here, particularly electricity, will furnish a basis to reason upon, and to form conclusions applicable to the actual condition of the sun, whence it appears to proceed. As, in commercial dealings, a small quantity of cocoa, coffee or wheat, taken from a large parcel, serves as an example of the whole; or as, in scientific experiments, the caloric which acts upon a thermometer in New-York, though very inconsiderable in quantity, is considered as an indication of the expanding quality of that agent all the world over; or as experiments on the analysis and synthesis of water at Paris have been deemed applicable to all water in every region and climate; so the author seems to suppose, and, as far as we can judge, with much appearance of truth, that experiments made in this world, upon substances emitted by the sun, will enable us to form as just an opinion as the nature of the case allows concerning the real constitution of that luminary, at least as far as those substances are concerned.

The work is divided into seven parts: 1. An historical review of the opinions of the ancients on the substance of the sun. In this the author quotes from the old writers, and chiefly from Diogenes Laertius and Plutarch, the accounts they have left to their posterity, of the speculations on this subject by Thales, Anaximander, Anaximenes, Diogenes of Appollonia, Anaxagoras, Pythagoras, Democritus, Euripedes, Metrodorus, Plato, Lucretius, and Hipparchus. In the exhibition of these opinions, the author has agreeably intermingled with his narrative biographical sketches, which diversify and enliven: and, among other things, he ascribes to Pythagoras a right conjecture as to the constitution of our solar system, which that distinguished Greek learned from the priests of Egypt. Pythagoras, he thinks, was informed of the doc-

trine of the four elements of fire, water, air and earth; that the sun was the centre of our system; and that the earth was spherical. That eminent ancient philosopher believed the light of the moon to be but the reflected rays of the sun; that the stars were worlds, and the planets were inhabited. The comets seemed to him to be eccentric stars, and the milky way clusters of small stars. Thus had his capacious and vigorous mind anticipated, by *a priori* considerations, a great proportion of those astronomical facts which have been verified by the discoveries of the moderns.

2. Mr. W. gives a concise, but comprehensive, review of the opinions of the moderns on the particular nature of the sun. In this literary exercise, the philosophical theories and systems of Des Cartes, Newton and Herschell, are stated in a summary way, and rendered additionally interesting by occasional biographical notices. He next considers the popular notion, that the substance of the sun is fire. He traces the origin of the idea of fire, and of the placing it by the ancients as one among the *four* elements. The dissatisfaction of the chemists with this quadruple arrangement is then exhibited, with the efforts of the alchemists to rank *salt* among the elementary substances; though the author mentions nothing of similar attempts in favour of *sulphur* and *mercury*. Then follow an epitome of the phlogistic doctrine of Stahl, and the oxygenous theory of Lavoisier. He states the opinion of Darwin, that the sun is a phlogistic mass of matter; and of the unfortunate Elliot, that the solar light proceeds from a dense and universal aurora surrounding his body on all sides.

From a consideration of all these opinions of philosophical and speculative men, as well in modern as in ancient times, Mr. W. concludes, that the question of the true substance of the sun has not been satisfactorily answered by any of them, but still remains a problem for the exercise of human ingenuity and talents.

3. He proceeds, in the third place, to produce his own hypothesis. That he might state it the more clearly, he has found it necessary to invent a new term, or rather to employ an old word in a new sense. This is the word *electron*, which the Greeks employ to signify succinum, or amber, but which Mr. W. has chosen to denote that peculiar matter or substance which has been called electricity and the electric fluid. He has carefully and happily selected this word because it had a near affinity to the terms already in use, and, therefore, made no outrageous innovation in language; and because it has as

near a resemblance and etymological connection with ηλεκτωρ, one of the Greek names for the sun. But as this part of Mr. W.'s publication is well calculated to afford our readers a specimen of his genius and expression, we shall lay it before them in his own words:

"After this review of different opinions, presented to the world by reflecting men, both of ancient and of modern times, and in every enlightened country, it is now time to advance the hypothesis which will be contended for in this work.

"The hypothesis, then, which will be advanced, and attempted to be maintained in this work, is, *that the substance of the sun is electron.*

"The term *electron* is devised for the purpose of this work, in order to designate a substance which has been for some time a subject of science, though its extraordinary phenomena still defy the utmost efforts of human genius and investigation.

"It will be proper to account for the selection of this term in this instance.

"No remark will more abundantly be verified in the history of science, than that a judicious selection of names for substances of which the reality and identity are either ascertained, or intended to be asserted, contributes greatly to advance the subsequent progress of knowledge respecting the substances themselves. An injudicious and confused use of words produces want of precision, and sometimes insuperable ambiguity, in a science, and thus greatly retards its future advances. Language is scarcely more useful as an instrument for the communication of ideas, than it is as an instrument of thought. He who is possessed of a correct and appropriate language, can not only pursue his own reflections with precision and certainty, but can, with equal precision and equal certainty, communicate the result to others.

"It is in vain that the easy and indolent mind inveighs against all innovation in language. In order to arrest innovation in language, it is first necessary to arrest innovation in knowledge; and this, if ever desirable, would be a measure highly to be regretted in the present barbarous and incomplete state of human science.

"True it is, that in a technical nomenclature, the innovations which are attempted by a visionary and fanciful projector are to be carefully distinguished from those innovations which spring from a just and feeling sense of the imperfection and

inadequacy of current terms. No one should dare to touch the nomenclature of a science, unless he attempts to advance the science itself. If his discoveries are essential and important, and such as eventually command the assent of mankind, a language justly applied to them will always claim attention; and it will be found that the consequent corrections of the prevailing nomenclature will be deemed equally sacred with the truths to which they are attached. If, on the contrary, a theory is so illy digested as to be immediately exploded, or if its effects are injudiciously appreciated, and the language of its advocate is, on these accounts, pregnant with falsehood, or inapposite and useless, he will find the latter to participate of the contempt and disgust which await the former. The virtue and good sense of mankind generally reward those who successfully persevere in enlightening them with merited applause; but such, unfortunately, is the uncharitableness of human nature, that he who, in the attempt to enlarge the boundaries of knowledge, has committed an error, is consigned to ridicule, to execration, and to infamy. These are the hard terms on which the votaries of science obtain their title to a small portion of public esteem; and to these hard terms, with all that fear and trepidation which their severity exacts, I, in common with others, submit.

" It has appeared to me, that the term *electricity*, as at present used, is accompanied with a very material defect, which there has not been hitherto an attempt to remedy. He who wishes to assert the distinct and independent existence in nature of a substance to which electric phenomena are to be ascribed, will find no proper and unexceptionable term in the current nomenclature by which to convey that idea. Those who have hitherto loosely admitted the idea of materiality, as attached to the cause of electric phenomena, have been compelled, in order to express the subject of that materiality, to use an awkward and deceptive circumlocution, the parent, if not of error, at least of ambiguity. To the adjective appropriate to the word they annex the substantive *fluid:* thus, while asserting the materiality of the cause of electric phenomena, asserting, at the same time, a dark and ambiguous position, which, if it should, on full investigation, be found to have some slender propriety in language, yet can impart no facility to the incipient acquisition of knowledge respecting the substance itself. Hence it is that the mind has yet scarcely drawn the distinction between the cause and the effect. The attention is engrossed by the latter; and it is only

by an effort of abstraction that the mind is enabled to grasp the former, to subject it to its power, and to handle it in a series of complex investigations. Hence it is, that long as electric phenomena have been the subjects of human curiosity and astonishment, as well in the unlearned as in the learned world, not only all the popular ideas of the substance are indefinite and vague, but the minds of many men of deep research have regarded it with transient and superficial attention. Satisfied with the evidence of the reality of the effects, they have soon become discouraged in their attempts to gain an acquaintance with the nature of the cause. Hence also it is, that while the most elusive and recondite matter has been perseveringly pursued through every protean transformation, arrested and held by the mind, and assigned its proper station among the elementary or compound substances of the new chemistry, electron, *as a substance*, has been totally pretermitted and forgotten.

"I cannot derive a stronger justification for the introduction of a new term, for the purpose of carrying on the discussion proposed in this work, than is afforded me by the history of the science last referred to.

"Every chemist, whichever of the conflicting theories he may have adopted, will be ready to acknowledge what a powerful effect the invention of the word *phlogiston*, by Stahl, of Prussia, had upon that science. It will have served for a whole century as an instrument of thought, of investigation and discussion, which has already advanced chemistry to a perfection, a dignity, and a utility, it could not before have aspired to. This effect attended the invention of the term alone, whether the theory on which it was predicated shall be found true or false.

"When Lavoisier, of France, advanced his doctrine, that the existence of phlogiston was entirely hypothetical; that it was not contained in metals; that the base of the air which it was supposed to form was to be sought in one of the component parts of *water;* that *water* was not, as had been supposed, a simple and elementary substance; and that an air, which was before supposed a compound, was derived from a simple elementary substance, the existence of which had not been previously known; to illustrate all these allegations, to introduce them to the apprehension, and subject them to the most rigid investigation of mankind, it was absolutely necessary to invent a new language, predicated on the truth of what was thus asserted.

"The same indefatigable labourer in the fertile vineyard of chemistry, when he wished to assert the *materiality of heat*, and its existence as a simple and elementary substance, did well to invent a term expressive of those ideas, and founded on the truth of those positions; and so, if ever an antagonist should arise, in direct hostility to these principles, and disposed to contend for the positive nature of *cold*, its *materiality*, and the existence either of itself, or of some other principle in combination with it, as a simple and elementary substance, it will be no less proper for him to invent a name expressive of that elementary substance, and founded on the truth of the positions he advances respecting it.

"Another important instance is afforded in our own country. Mitchill, of the United States of America, has advanced the hypothesis, that the *azote* of the French chemists, the principle of that air which Priestley, of Great-Britain, imagines to be derived from two others, without an independent origin of its own, is the basis of all pestilential fluids; that oxygen gives activity to this substance; that, when it becomes an acid, it is quelled, as all other acids, by alkalies. Hence he has deduced his ingenious proposals for permanently securing the health of cities; an object the most interesting to the United States of America of any which can at this time be agitated. Contemplating the subject in this light, he has given a *positive* name to the substance of which he speaks, and on which he builds so important a theory, in lieu of the *negative* name given to it by the French chemists. The introduction of the term *septon* will advance the science to which it is allied, and that whether the theory of its learned inventor should hereafter be established or overthrown. It will either be itself the foundation of a true theory, or become an instrument, in the hands of some succeeding investigator of science, to produce it.

"Thus, in the present instance, believing the materiality of the substance of which I speak, and its existence as a distinct and elementary substance, not generated from, or compounded of, any other matter known to us, and desirous of considering this substance in consistency with these positions, abstracted from any effects it really does, or is supposed to produce, it is necessary to find a term distinguishing the matter or substance itself from the mere effects of its presence, its motion, or any other affection of it. This the present nomenclature of the science to which it belongs does not af-

ford; and, therefore, a term is selected for that purpose, as analogous to existing terms as can be formed.

"For these reasons I shall use the term *electron*, to designate the matter itself, which is here spoken of, contemplating it as an elementary substance, not compounded of any other substances presented to our observation upon this earth; the term *electric*, as the correlative adjective—the term *electricity*, when speaking of the effects produced by the presence of electron, or when speaking of our knowledge of electron as a systematized science—the term *conducting substance*, to express those bodies through which electron passes readily, without any, or with little resistance—and the term *excitable substance*, to express those bodies by means of which an accumulation of electron is artificially procured."

4. In the fourth division of his subject, the author offers an historical account of electric discoveries, noting what was discovered successively by Thales, Theophrastus, Gilbert, Boyle, Guericke, Newton, Hawksbee, Grey, Du Fay, Von Kleist, Cunæus, Musschenbroek, Dalibarb and Franklin, and exhibiting a compendium of the progress of that branch of science.

5. Mr. W. then enumerates some of the most remarkable phenomena in which electron, *as a substance*, is observed to be present. And the phenomena of lightning, thunder, aurora borealis, lucid meteors, earthquakes, of the gymnotus and torpedo, and of the artificial electrical machine, are separately and distinctly considered.

6. Having stated these facts, the author proceeds to the more immediate object of his undertaking, which is to adduce those powerful considerations which lead him to conclude that the substance of the sun is electron. Here the reasoning he adopts is of the analogical kind, pointing out the similarity of appearance and effect between *terrestrial* and *solar* electricity; or, in other words, between electron, as it operates in our mundane system, and electron, as it manifests itself in and about the body of the sun. The point to which the author's reasoning is directed is, that the sun is the great reservoir or magazine of electron for the worlds which surround him, or the vast electrical machine for the universe. Though the reasoning herein is analogical, our readers will remark that the analogy is of the closest and strictest kind. The analogies between electron, as collected by *artificial machinery*, and electron, as exhibited by *solar machinery*, are the following: 1. Both of them are accompanied by light and heat. 2. Both have a similitude of sensible appearances, like dense luminous

fluids, or masses of elementary fire or light, corresponding in colour. 3. Both have a tendency to assume a spherical or globose figure. 4. They resemble each other in the property of attraction. 5. They also both possess a power of repulsion, which they communicate to the earth and to the sun, and, generally, to every species and particle of matter which they pervade. 6. The curious experiments related by Grey to Mortimer, and, in part, repeated by Morgan and Adams, of the revolutions which small bodies were made to perform around large ones by artificial electricity, resembling the circular and elliptical motions of the planets around the sun, and of satellites round their primaries. 7. Besides these points of agreement between *electron as excited by art*, and *electron afforded by the sun*, there is no memorable difference between them but in degree or quantity; and as to that, the old axiom will apply—*Magnitudo non facit differentiam.*—The author's sentiments, under the fifth and sixth of these heads, are so original and curious that we extract them for the instruction of our readers. After reciting the opinions of Newton, Buffon, Bowdoin, Herschell and Darwin, as to the cause of the *centrifugal force of the planetary bodies*, he proceeds thus to offer his own reasons for believing that it is owing to a repelling power in the mass of electron of which the sun is composed.

"These different opinions are so hypothetical, so removed beyond the test of analogy and experiment, as to be equally unsatisfactory. It would afford a relief to the mind, to be able to discover a single circumstance which would authorise the presumption, that the sun possesses a *repulsive* as well as an *attractive* power, and that the planets which revolve around it are the objects of the one, as well as of the other of these powers.

"Both the repulsive and attractive powers of electron are at present mysterious. We cannot comprehend what are still termed the plus and minus states; or why *dissimilar* states, as in magnetism, produce attraction, and *similar*, repulsion. We cannot, indeed, assert that electron itself is either homogeneous or heterogeneous in its nature. Without, however, any solution of these questions, we may readily conceive that a mass of matter may be heterogeneously composed in respect to these two powers; so that, if its homogeneous parts were separated, a mass of electron would exert upon the one an *attractive*, while upon the other it exerted a *repulsive* power. Without extending the inquiry to the heterogeneities of the

matter of the sun, we actually find that our earth is of heterogeneous composition with respect to electron; or, in other words, that it is *a sphere of conducting matter, charged with electron.*

" Having the strongest reason, from its strict analogy with electric phenomena, to believe that the attractive power which the earth exerts upon matter at its surface, inheres in it by virtue of its being *a sphere of conducting matter charged with electron*, we readily comprehend why, if it was capable of exerting a *repulsive* power also, the effects of that power should escape our observation. If ever there was on it, or near it, any matter on which, as a whole, it exerted a *repulsive* power, as strong as it still exerts upon other matter an *attractive*, such matter must long since have been detached and removed from it. We find, however, that when a small portion of that electron with which it is charged is artificially detached from the whole mass, it possesses the *attractive* power in a stronger degree than *the whole charged conductor;* and, in this situation, the natural and permanent arrangement being somewhat disturbed, the evidences of a *repulsive* power begin also to be manifested.

" We have an additional reason for believing that the earth is not destitute of a repulsive power. Three instances of specific attraction are presented to our observation upon this earth—chemic attraction, magnetic attraction, and electric attraction. In the two latter we uniformly find the correspondent quality of repulsion. The nature of the first is so mysterious, and our acquaintance with it is at present so slender, that it would be premature to assert either that there does, or does not, exist a correspondent quality of repulsion. In the attraction which subsists between the sun and the planets, whether it should be deemed a specific attraction of its own kind, or one of those already known, it would be rational, from analogy, to infer, that a cotemporaneous power of repulsion exists, which would not fail to be observed, if the objects upon which it was exerted were present.

" Indeed, it appears extraordinary, that while a general *attractive* power has been attributed to matter universally, a correspondent *repulsive* power has not been also attributed. If it is to the attraction of the parts of a body to one another, that its *cohesion* is ascribed, to what quality but *repulsion* ought to be ascribed its *impenetrability* and *resistance to the touch?*

"In one instance we have an indubitable proof that a repulsive power begins to be exerted at a considerable distance from the repelling body; and is exerted with the greater strength, in proportion as the distance becomes less. This is in the reflection of light by a glass mirror. Newton, of Great-Britain, has shown, that a ray of light, impinging on a glass mirror, begins to be repelled at a considerable distance from the surface of the mirror, and is actually retroverted without ever having come into contact with it. Priestley, now of the United States of America, formerly of Great-Britain, in pursuance of these observations, has gone so far, in his disquisitions on matter and spirit, as to deny that, in any case of resistance by matter upon matter, there is an actual contact; but that it is only a *repulsion*, infinitely increasing in proportion to the approximation; and that, when that repulsion has once been overcome, all further resistance ceases.

"Certain it is, that, with respect to all our senses, effects are produced which appear to have little resemblance to their causes. The sense of hearing is but the effect of the impingement of matter, in a fluid state, upon the extremities of the *auditorial nerves;* and the sense of seeing is but the effect of the impingement of matter of very great *tenuity*, and very great *velocity*, upon the extremities of the *optic nerves.* So the sense of *feeling* is probably only the effect of a *repulsive power in other matter, exerted upon the matter of the human body.* Whenever, therefore, a species of matter really exists, which possesses little or no repulsion of that kind, such as *light*, or *caloric*, or *electron*, we may, by the exercise of reason, obtain the demonstration of its materiality; but we cannot have the direct evidence of the sense of feeling.

"To return to the repulsive power of the sun, as *a mass of electron*, upon the planets, *as charged conductors*, let us, as in the former instances, imagine that state of absolute and perfect insulation, which it is so difficult, if not impossible, to obtain upon the surface of this earth. To a spherical mass of electron, in this situation, let us present a sphere of conducting matter charged with electron, bearing to each other the proportion of a planet to the sun. Whether we consider an axual revolution as inherent in an insulated sphere of electron, or whether we conceive such a motion to be imparted to it from any extraneous material or mental agency, the effect of producing both an axual and orbitual motion, in a sphere of matter heterogeneously composed with respect

to its *attractive* and *repulsive* powers, would appear, *a priori*, to be the inevitable result. Whether this result has ever actually been obtained in our experiments upon this earth, is a question which belongs to the succeeding consideration.

" The sixth consideration in favour of the sun's being a sphere of electron, is, then, the partial proof which we have derived from an experiment tending to substantiate that fact.

" This experiment, like that relative to the sphericity of an insulated mass of electron, and its tendency to an axual revolution, is curious in its kind; the result of accidental combinations, which our reason has not yet attained sufficient vigour spontaneously to repeat.

" The authenticity of the experiment cannot be doubted, because it is attested by men of veracity, one of whom repeated his account of it to the other on his death-bed; and that other once succeeded in the repetition of it, though, unfortunately, at a time when no witness but himself was present.

" The experiment establishes, in a manner almost conclusive, the general theory maintained in this work; and presents us with an orrery of no mechanical kind, but apparently *animated with that vital energy* which the system it was made to imitate possesses. It was performed by Grey, of Great-Britain, of whom mention has been already made. The following account of it is in his own words:

' I have lately made several new experiments upon the projectile and pendulous motions of small bodies by electricity; *by which small bodies may be made to move about large ones, either in circles or ellipses; and those either concentric or eccentric to the centre of the large body about which they move, so as to make many revolutions about them.* And this motion will constantly be the same way that the planets move about the sun, that is, from the right hand to the left, or from west to east. But these little planets move much faster in their apogeon than in the perigeon parts of their orbits; which is directly contrary to the motion of the planets about the sun.'

" This account excited much speculation and curiosity. Skeptical minds could not admit the possibility of so strange an effect. The general impression was, that the experimentalist was sincere in his assertions, but that his senses had been deceived.'

" On his death-bed he related to Mortimer, his countryman, the manner in which they had been made. The following is the statement he gave:

'Place a small iron globe, of an inch, or an inch and a half in diameter, on the middle of a circular cake of rosin, seven or eight inches in diameter, *greatly excited;* and then a light body, suspended by a very fine thread, five or six inches long, held in the hand, over the centre of the cake, will, *of itself, begin to move in a circle round the iron globe,* and constantly from west to east. If the globe is placed at any distance from the centre of the circular cake, it will describe an ellipse, which will have the same eccentricity as the distance of the globe from the centre of the cake. If the cake of rosin be of an elliptical form, and the iron globe be placed in the centre of it, the light body will describe an elliptical orbit of the same eccentricity with the form of the cake. If the light body be placed in or near one of the foci of the elliptical cake, the light body will move much faster in the apogee than in the perigee of its orbit. If the iron globe is fixed on a pedestal, an inch from the table, and a glass hoop, or portion of a hollow glass cylinder, excited, be placed round it, the light body will move as in the circumstances mentioned above, and with the same varieties.'

"He added, further, '*that the light body would make the same revolutions, only smaller, round the iron globe, placed on the bare table, without any electrical body to support it;*' but he stated, 'that he had not found the experiment to succeed if the thread was supported by any thing but a human hand, though he imagined any other animal substance would have answered the purpose.'

"After the death of Grey, Mortimer made many unsuccessful attempts to put into practice the preceding directions. In one instance alone he succeeded; but no person but himself being present, the same skepticism induced men of literature to believe that, like Grey, his senses had been deceived. The repetition of the experiment was attempted by others, but without success. Some supposed that the successful instances had taken place by candle-light; and that the cause of failure had been the attempting them by day-light. There is no doubt that the combustion of a candle, or of a fire, in the vicinity of the experiment, would have a material effect upon it one way or the other; but the probability is, that the effect would have been the reverse of that which has been supposed. If it were not contrary to the determination I have adopted in this discussion, not to interfere with the theories

of light and heat, I would attempt to show that caloric is really material, *and that it is a conducting substance;* that the extrication of it, therefore, by the process of combustion, in the vicinity of an electric experiment, must have a sensible influence; and that it is owing to an extrication of it insensibly produced by the friction of the apparatus, that electron is always so equally diffused through the Boylean vacuum, and becomes dispossessed of its attractive and repulsive powers.

"It is worthy of remark, that one part of the experiment of Grey has been often repeated, and may at any time be repeated: that is, the execution of the experiment by means of a glass hoop, or portion of a hollow glass cylinder, excited. Morgan, and Adams, both of Great-Britain, have repeatedly performed this part of the experiment; though the latter states that there is much nicety required in it, and that many attempts will be necessary before that nicety is attained.

"If an experiment so nearly approaching to a demonstration of this theory has been actually performed, even in this imperfect way, what might we not expect if a state of *perfect insulation* could be obtained, and *a solid sphere of electron* made the instrument of our experiments? A reflecting mind can scarcely entertain a doubt that it would be attended with perfect success, and that a complete demonstration of the hypothesis here contended for would be the result."

The seventh and last division of the work before us contains Mr. W.'s suggestions as to the means necessary for subjecting his hypothesis to the test of direct experiment. To this we refer as indicating a provident and circumspect mind.

We cannot conclude our account of this piece of philosophical research, without expressing our approbation of the candour and liberality which characterize it. Although the author is adventurous and daring in his undertaking, yet he conducts himself every where with a becoming diffidence and modesty. Differing as he does from those who have gone before him, it is remarkable with what fairness he states the opinions of others, and with what manliness and respect he mentions their authors. We observe no traces of a censorious or dogmatical spirit. What he advances he knows and acknowledges to be but an hypothesis; but he is of opinion, and in this we concur with him, that it looks more like an approximation to truth than any with which we are acquainted

on the same subject. We hope, therefore, the philosophical corps will march forward where this pioneer has led the way. We regret that he has omitted the consideration of the scientific history of heat and light; but his reasons (see sect. 183) for waving the minute consideration of them, will probably satisfy most of his readers.

ART. II. *A Letter to Dr.* Percival *(of Manchester, in England), on the Prevention of Infectious Fevers: and an Address to the College of Physicians at Philadelphia, on the Prevention of the American* Pestilence. By* John Haygarth, *M. D. F. R. S. &c.* 8vo. pp. 188. *Bath.* Crutwell, *for* Cadell & Davies, *London.* 1801.

ALREADY have the Americans received advice from France concerning the method of preventing and curing the endemic distemper of their cities during the hot season (Med. Rep. vol. iii. p. 204). Since the receipt of that communication, something of the same kind has been forwarded to the United States from Ireland. (Med. Rep. vol. iv. p. 83). And now a book of counsel and knowledge, intended for their use and edification, is sent over from England. They ought to feel grateful for the favours thus intended them. The sympathy of the wise and the learned in foreign countries, cannot but affect them in an agreeable manner. In cases of difficulty and distress, what can be more welcome than the disinterested suggestions of friendship?

There is nothing which the generality of mankind part with more freely than advice. Almost every person thinks himself capable of imparting something of importance to his weak or ignorant neighbours. Commonly, however, this proffered admonition, being but of little value, is lowly estimated: for vanity, which prompts the adviser to urge his counsel, is frequently more conspicuous than ability. Yet, for the most part, these public and private monitors are not to be denied the merit of good intentions. The mere sentiment of benevolence, however, though laudable in him who feels it, is of no substantial advantage to the person who suffers for want of help. Abstract philanthropy, to be efficacious, ought to be followed by directions derived from a profound and practi-

* It may now be called the *Spanish* pestilence too. See p. 105 of our present volume.

cal knowledge of the subject. And he who has been most conversant in the scenes, transactions or business upon which he ventures to give information to his fellow-citizens, will be most capable, other circumstances being equal, to do it correctly and effectually. But although a kind heart and an intelligent head should unite in the person who undertakes to influence the opinions and conduct of an individual, or of a great body of men, something more than these is highly requisite. The *manner* of doing a thing is not unfrequently almost as important as the matter itself. Often has it happened, in human affairs, that counsel which has been well-meant, and even ably devised, has failed in its effect, because it was accompanied with something odious, disgusting or insulting, in the mode of communicating it. The precepts and example of Cato would have had more sway in ancient Rome, had the censor been as remarkable for good breeding and politeness as for honesty. And the arguments and eloquence of Demosthenes would doubtless have been exerted with more effect, had not the orator affronted the Athenians by frequent reproaches and abuse. It is not enough to convince men they are wrong, and coldly tell them what is right: to work reformation there must be a prudence, a suavity, an earnest concern, and a persuasive kindness; there must be the style of the optative mood, to temper the bluntness of the indicative, and the harshness of the imperative.

These reflections are suggested as well by the manner as the matter of the didactic pieces which have been received from Europe on the subject of pestilential diseases. Writing to the benighted regions of the west, from the countries where light and science had an earlier dawn, the *wise men of the east* address the transatlantic people as gropers in darkness and error. They seem to forget that, in the revolutionary course of things, the light of science, as well as of day, may, perhaps, shine brightly upon these tracts of earth, after it shall have been withdrawn from theirs.

Although the American States can no longer be viewed as colonies or provinces dependent upon the *politics or government* of sovereign Europe, still the schools of that quarter of the globe claim America as a district of their literary empire, and usurp *scientific* dominion over the minds of her inhabitants. They pretend that they must see for them, and hear for them, and feel for them, and not they for themselves. They affect to gather facts for them, to make experiments for them, to reason for them, and to judge for them, lest, through

their extreme imbecility, they should go astray. They insist that they have a right to legislate for them, to bind them in all cases whatsoever, and to treat them as rebels if they disobey. But it is time for Americans to abjure publicly all such supremacy, and to assert their own dignity and privilege; to declare, that on the ground of free, fair, and equal discussion, they will meet them as philosophical friends: but to proclaim, that they will exercise their senses, their understandings and their judgments, free from all authority, dogmatism, or any other controul, save that of truth alone.

We are at a loss to discover what it is that makes such a mighty difference between an European and an American mind; why the former should claim the authority to command, and the latter be required implicitly to submit. Is it that the institutions of Europe are better? Hundreds of our youth have been educated there, and have profited by the good things which they inculcate. Are the instructors more wise and learned? These Americans have crossed the Atlantic to grow wise and learned by hearing and imitating them. Are the opportunities preferable? These too have been enjoyed. In medicine, particularly, the wards and cases of the sick of Guy's, St. Thomas's and St. Bartholomew's Hospitals, are as well known to many Americans as to native Britons. The opinions and doctrines of the College, and practice of the Infirmary at Edinburgh, are as well understood by natives of Virginia and Carolina as by those of Perth and Inverness. Physicians who have listened to the lectures of CULLEN, and even to the prescriptions of AKENSIDE, are frequently to be met with in America.

Or, is there some hebetude of intellect, some unhappy defect of capacity, which distinguishes and degrades the man of the west? We shall not affirm positively that this is not the case, though certainly we have no evidence to convince us that it is. On that point we shall be content to let their comparative merits be judged of by others.

In one respect, American physicians, who have been educated in Europe, have unquestionably the advantage over Europeans who have never visited America: and this is in the knowledge of their own climate—the peculiar vicissitudes of the seasons—the manners, occupations, and way of life among the inhabitants—their local condition and circumstances—their constitutions—the exciting causes of their diseases, and the mode of treatment which experience has pronounced best. Such a man unites to all the information he can gain in the

schools of Europe, all this additional knowledge, which his voyage from one part of the world to another enabled him to acquire; but which the European, who never travels nor examines for himself in foreign countries, never can acquire.

It might, indeed, be affirmed, that native American physicians, who have pursued their professional studies at home, are, to say the least of them, on the same footing with those Europeans. Such have attended courses of public instruction in universities and hospitals. They have had the advantages of public libraries, and of the conversation of the learned. And, during their attendance upon the instruction derived from others, they have been enabled to see for themselves, the domestic production, destructive operation, and gradual extinction of pestilential fluids. Professional men of this class have a better right to judge, preferable means of judging, and higher claims to credit, on the endemic and epidemic distempers of their own city and country, than a speculative member of the faculty, who dwells beyond an ocean three thousand miles wide.

American physicians, in common with their fellow-citizens, have their feelings excited for the calamities which some of their towns have experienced by sickness. These visitations bring to their recollection the more frequently repeated and more severe ones endured by London, Rome, Paris, and even Newcastle upon Tyne. Their interest impels them to explore and develope the causes of these unhappy events: and no motive can be found more powerful than this. The property in houses and lands, which many of them possess, in streets and places which have undergone the ravages of disease, may be supposed to render them vigilant as to every inlet or lurking place of pestilential poison. An occurrence in which the lowering of rents, and the consequent lessening of income, are concerned, may be expected to stimulate the mind to the nicest examination of facts. A poison which, in the city of New-York, has destroyed, within three months, the lives of more than twenty practitioners of medicine, well deserves to be traced and understood by the survivors. And yet, with all these opportunities to acquire knowledge on the subject, and with all these incentives to vigilance and care, the American physicians and philosophers, who have viewed the rise and progress of pestilence—walked amidst it by day and by night, year after year—beheld their friends and fellow-citizens falling around them as on the field of battle—endured its violence in their own persons almost to the extinction of their lives—and

suffered from it largely in the depreciation of their property—these men, we say, are considered as incompetent witnesses before the judges of the medical tribunals of Europe.

One of the most rigid and intolerant of these is Dr. Haygarth, the writer of the volume now under consideration. This author had acquired, some years ago, a good share of reputation, by two publications, entitled, "An Inquiry how to prevent the Small-Pox," and "A Sketch of a Plan to exterminate the Casual Small-Pox in Great-Britain." And his fame might have been perpetuated with the spread and adoption of his schemes, had they not been superceded, and rendered abortive, by the splendid discoveries of JENNER. The substitution of the vaccine instead of the variolous poison, being more practicable, sure and easy, than the plans of Dr. Haygarth, has already rendered the books which he has published uninteresting and useless, or nearly so.

The prevention and extermination of the small-pox was thus provided for, not only in the British Islands, but all over the earth, by a plain and simple operation, utterly subversive of the labours of this gentleman. The nice calculations and estimates, the ingenious theories and disquisitions, the noble projects and designs, which had long engaged his attention, were ruined at a stroke. The books which contained them ceasing to be demanded or perused, were forced to retreat to the lumber-rooms of learning. And, in reality, the humane and public-spirited author was in danger of outliving the works which he had flattered himself were to be the brazen monuments of his fame.

In this deplorable state of things, what remained for a disappointed and disconsolate author to do? It would be vanity and folly for him to contradict the reality of that discovery which prostrated his schemes and his hopes. But there was another course for him to take, which promised, at first, to be nearly as successful as the one in which he had been foiled. This was to apply the same rules which he had laid down for circumscribing and extinguishing the contagion of small-pox, to the prevention of nervous and yellow fevers. But to make the directions correspond exactly, it was necessary to declare these two latter diseases were contagious like the former. And this being roundly done, British typhus and American pestilence were both comprehended within the small-pox regulations. In publishing a book upon this plan the author has the satisfaction of quoting his obsolete volumes, which every body else has ceased to quote—of referring to his labours and

improvements on the small pox—and of making an application thereof to whatever diseases he shall please to denominate contagious. The present volume answers the double purpose of being a sort of index to the former books, and of letting the public know, that notwithstanding the disappointment concerning small-pox, Dr. Haygarth has something to offer on two other diseases which *he* says are contagious; applying the delicate epithets, "frivolous, inadequate and groundless," to the reasons of those who are of a different opinion. (p. 147).

The work is divided, as expressed in the title-page, into two parts. In the former Dr. H. treats of the "infectious fever," called *typhus*, which infests the habitations of nasty people in the towns and villages of England. In the latter he discourses of the *pestilence*, called "yellow fever," which is engendered in nasty ships, and other nasty habitations of men on shore, in the cities of North-America.

In the former of these pieces the author exhibits some valuable facts and deductions which are highly worthy to be made known. And we announce them with the greater pleasure, as it is our wish to let no part of the *valuable* matter which it contains be lost. Being the result of his long and meritorious labours to better the condition of the poor, they are entitled to much credit. They contain the substance of his *preliminary principles*.

Dr. H. has given a table, exhibiting the progress of infectious fevers in families (p. 20). To this are added a few pages of proofs and illustrations. Though the memorandums are imperfect and scanty, they prove that the exciting cause of disease was engendered amidst nastiness and corruption. The greater part of the cases between the 37th and 68th, appear, on the face of the narrative, to have originated from such sources. To the same origin must be ascribed the typhus fevers which affected the thirteen families at Middlewich, under the care of Mr. Taylor; the greater part of which are described as living in close, small and dirty dwellings, and oppressed with poverty, filthiness and neglect (p. 29). If members of families, or visitors and attendants, are exposed for a sufficient length of time within these manufactories of infectious vapours, twenty-two out of twenty-three, or even more, will be poisoned by them (p. 31). When the venomous gas is much diluted in a clear, large and airy chamber, its virulence is so much abated thereby as to render it incapable of exciting typhus (p. 38). And even in its concentrated state it does not readily infect physicians, and other transient visitors

who stay but a short time in a room (p. 40); though they sometimes are poisoned by it. The inhabitants of nasty and pestilential jails can gradually grow accustomed to their envenomed atmosphere, and become seasoned to it, through an acquired inaptitude in their constitutions to be rendered sickly by it (p. 44). This infectious gas is more noxious in a foul than a pure air.

Dr. H. thinks the poison of small-pox is contagious at a greater distance than that offspring of nastiness which causes typhus (p. 48). The clothes of visitors do not imbibe infection enough to be dangerous (p. 54). But the variolous virus is more quick in its operation than the typhous; the latter not producing, in certain cases, actual disease until the 68th day after its application to the body (p. 67). The mortality occasioned by this home-bred poison in the large towns of Great-Britain is enormous. The diseases produced by it "appear to be the chief cause why there is a much greater proportional mortality in large than in small towns, and houses dispersed in country situations. Lanes, entries and courts, communicate the infection to each other. *Whole families sink down together, oppressed with putrid fevers, in penury and wretchedness, without a single hand to afford them help or comfort.*" (p. 117). Dr. H. supposes, and, we think, with great probability, that the *pestis* of Livy, so frequently fatal to the inhabitants of Rome during the growth of that city, and the *plague* of the English writers, so destructive of life in London, in its progress to its present unwieldly size, were no other than distempers from a similar exciting cause (p. 121). Nastiness, excrements and corruption, were the steady accompaniments and forerunners of their typhus, in ancient no less than in modern times. And cleanlines, ventilation, and separation of the sick, will attenuate and destroy the poison, and, by degrees, dispel every apprehension of danger (p. 165).

It would scarcely be thought possible, that a man who had seen so much, and observed so well, could not distinguish between such an exciting cause of disease as has been described, and a specific contagion. Yet this is evidently the case with our author. Though he entertains doubts whether typhous fevers are *always* produced by a specific contagion? and whether they are not *also* engendered in close, dirty, crowded rooms, by peculiarities of season and the like? still he has found nothing convincing enough to win his assent to the latter query.

Herein Dr. H. is undoubtedly mistaken. And the error is

natural enough to persons of but an ordinary share of discriminating power. To such the words *contagion* and *infection* appear to be perfectly synonymous. By such, *dirt* and *nastiness* are employed as convertible terms: and to such there is no distinguishable difference between a poison *produced by morbid animal secretion*, as that of small-pox, and one engendered by mere *chemical action in certain forms of inanimate matter*, as that of typhus. But by a mind accustomed to note the diversified phenomena of nature, that *vitiated product of living vascular action*, which can excite in a well person a disease like that by which itself was produced, and continue indefinitely to do so after being transferred from one body to another, will be denominated CONTAGION; and lues, vaccinia, measles, and small-pox, will be considered as examples of it. On the other hand, that *venomous offspring of putrefaction* going on in some of the kinds of organic matter *after death or separation from the living frame*, which disorders the healthy functions without being specifically communicable, and without the power of communicating itself, will be called INFECTION; and typhus, dysentery, plague, and yellow fever, will be given as instances. By a mind of this correct constitution, "dirty" will be understood to mean the collection of such *mineral substances* as constitute the upper strata of the earth, clay, sand, dust, &c. in the human body, in its clothing or habitation. "Nasty," on the contrary, will be employed to express that condition of body, dress, bedding, house and furniture, *induced by those animal excretions and excrements*, which constantly exude from the pores and ducts, and taint and envenom the substances to which they attach themselves. A mason's frock is a *dirty* thing; a beggar's blanket a *nasty* one. A house may be *dirty*, that is, it may have sand strewed about the floor, dust resting upon the furniture, ashes sprinkled over the hearth, and pieces of broken plaster scattered along the stairs; and yet this house may not be unhealthy: but where a habitation is *nasty*, and the beds and bedding are saturated with urinous and perspiratory discharges, the floors besmeared with fæces, and bronchial phlegm, and every thing porous and bibulous charged with something convertible to stench and venom, the inhabitants must possess hardy constitutions indeed if they can withstand this combination, this confederation of mischievous powers.

It is from *nastiness* degenerating to *infection* by chemical changes among its particles, that the bodies, clothes, beds and

apartments of the poor in Great-Britain, derive their poisonous, their pestilential charge. In the books of physic, and in the lectures of its professors, it has been fashionable to call this virus *human contagion*, and its exhalations *human miasmata*. As well might the contents of a jakes be called "contagion," or the reekings of a dunghill "miasmata." It is a poison formed by intestine workings among the elementary ingredients of excreted and inanimate matter, and as distinct from the vascular energy by which contagion is elaborated, as death is from life. There is not an atom of contagion in the case; for contagion, like other secreted fluids, is not imitable by any *artificial* process, and cannot any more than bile or semen be prepared in a laboratory by synthesis. By a common putrefactive process this SEPTIC VENOM is formed, and derives none of its qualities from pulsating arteries or glands. Away, then, with this preposterous phrase from the poison engendered by *septic processes*, and let "human contagion," for the future, mean nothing but small-pox, vaccinia, and the kindred forms of *morbid secretions*.—It is high time that the products of putrefaction should be distinguished from those of secretion.

But what shall become of the charming names, "miasm,"* "miasma," and "miasmata," which are of such usefulness and power, that in the present fashion of thinking, both speech and writing would be deficient and inexpressive without them? In these revolutionary overturnings must they too be deprived of the empire they have held in the schools ever since the days of Galen, and be reduced to the common level of plebeian words? It would conduce eminently to the interest of medicine that they should. But are there not, it may be asked, atoms which fly off from natural bodies under the heat and pressure of the atmosphere? Do not human excretions emit such atoms? and why may not these be called *human* miasmata? Because the phrase is indistinct, and conveys no precise idea to the mind. By the same rule, the excretions of horses and cows ought to emit *brutal* miasmata; roses and pinks ought to discharge *floral* miasmata; turpentine and tar ought to afford

* The classical knowledge of Dr. H. will inform him that miasma is derived from μιαινω, to pollute or befoul; and, by the exquisite refinement and copiousness of the Greek language, μιασμα signifies both *nastiness* and *criminality*—uncleanness of body and defilement of soul. Therefore it may be inferred, that in ancient times, when the word begun to be employed medically, and the constitution of the gases was unknown, it could only apply in its literal sense to the grosser and more palpable forms of matter.

piny miasmata, &c. There is nothing correct and scientific in these ways of expression. It is true, indeed, that particles of pulverized earth may be raised into the atmosphere by wind; particles of carbon, &c. may be carried aloft, and collect into soot on the sides of a chimney; and particles of powdered wheat may float through a manufactory of flour. These are proper illustrations of this term; for they are *miasmata of dirt, of charcoal,* and *of meal,* which, having never undergone chemical solution in caloric or in air, but being merely mechanically attenuated and subdivided, retain their opacity, and reflect light, unaltered in their constitution and nature.

" Miasms" (so Dr. H. anglicizes the word) thus mean particles of matter, *like motes in the sun-beams,* which have undergone a *mechanical,* but not a *chemical* change: and the idea corresponded to the ruder state of philosophy, when the term was brought into use. But since that remote era the constitution of *permanently elastic fluids* has been explored; the volatilization and solution of bodies by heat has been investigated; and the weight and measure of *aërial* compounds detected, though their perfect transparency eludes all examination by the eye. These invisible compounds, of which the ancients had no proper conception, are the result of *chemical agency,* and they indicate or accompany an intestine alteration among the constituent ingredients of the substance. When water undergoes such a change by solution in caloric, it is denominated *elastic steam,* or *watery gas;* if air is the menstruum, it is called *exhalation, vapour,* or *evaporation;* when the transparency of the solution is disturbed, *visible* or *inelastic vapour,* as cloud, fog or mist, is the result. In Dr. H.'s language, both the solutions of water in caloric and air should be called *aqueous* miasms, as the vapours from human nastiness are termed " *infectious* miasms." (p. 56).

This attachment of Dr. H. to the corpuscularian hypothesis has led him into another fundamental error concerning these kinds of poisonous fluids. He contends that the " infectious miasms are invisible," that they constitute a " poisonous vapour," and that this " poisonous vapour is united with air by solution." (p. 56). Here is a curious process indeed, *of an invisible vapour undergoing solution in air!* (p. 158).

Had the learned author opened one of the modern elementary books of chemistry, he would have found that any thing whatsoever, which is volatilized by heat, becomes itself, by the union, an air or gas. His " invisible infectious miasms"

are themselves already in an aërial state. His "poisonous vapour" is in reality neither more nor less than pestilential air, or infection rendered volatile by heat. And his "union of poisonous vapour with air by solution" is as unnecessary as it is unphilosophical. The blunder in science which Dr. H. has committed is this: he affirms *that infectious poison is chemically dissolved in air;* WHEREAS, IN FACT, IT IS ONLY DISSOLVED IN CALORIC. It is not indebted to the atmospheric gases for its volatility and fluidity, but is itself a gas, totally distinct from mere oxygen and naked azote, even as they are gases by virtue of the caloric which gives them their permanent elasticity. Formed from *septic* materials, by a *septic* process, it is a *septic* gas, or pestilential air, which may diffuse or spread itself through the atmosphere, after the manner of hydrogenous gas, or carbonic acid gas, or any other species of air, and is pellucid and invisible for the same reason.

If, as Dr. H. contends, *infectious vapour was dissolved in air*, there would result from the combination a consequence which he seems not to foresee. Every chemical combination is attended with a change of qualities in the bodies combined, and the formation of a third product, endowed with new qualities. Infection, by chemical combination with atmospheric air, ought to turn to a *tertium quid*, to be neutralized and disarmed of its venomous qualities.

"United with air by solution." With what sort of air? If he means the atmosphere, is it with the dephlogisticated or phlogisticated portions? or both? But we must pass on to what our author remarks on *fomites;* though, as we have discussed some of his opinions already at great length, we refer our readers, for more minute and circumstantial information on them than Dr. H.'s book contains, and on some other points of the present inquiry, to Med. Rep. vol. iii. p. 168, and to Duncan's Annals, vol. iv. p. 359. Though we cannot avoid remarking, cursorily, another incorrect opinion of our author. He talks of the "increase of malignity in the *febrile poison* when it has long lodged *and putrefied* in dirty clothes and confined air." (p. 46.) Here *febrile poison* is declared to grow more malignant *by putrefaction!* If contagion *pre-exists*, and undergoes putrefaction, that process must disorganize and decompose it, as it does all other things. The poison would be destroyed by such a process. But the way in which putrefaction engenders poisonous fluids is by forming new and mischievous associations from substances that were

innocent before. The harmless carcase of a lion may, by putrefactive decomposition, turn to pestilential air; but in so doing it will change its original organization. In like manner, if the *poison of fever*, or any other sort of venom, is subjected to the putrefactive process, it will turn to something else to be sure, but during the conversion will lose its primitive constitution. We hope to hear no more of the mischief produced by the *putrefaction of contagion!*

And this is the man who abuses and vilifies the American physicians, philosophers and statesmen (p. 152 and preced.) for "not opening their eyes to the pernicious delusion, which has so marvellously and dangerously prevailed, concerning the origin of their pestilence." Because, forsooth, they will not declare, with him, that *dirt breeds contagion*, that *contagion is increased by putrefying, then turns to an invisible vapour, and dissolves in air.* When they assent to these notions, they will fully deserve all the reproaches he has bestowed upon them.

Having thus stated the difference between contagion and infection, between dirt and nastiness, between miasms and gases, and shown that, by confounding them, Dr. H. has overturned the landmarks by which he ought to have directed his course, we pass on to the *practical conclusions* which he has derived from his experience in febrile diseases. And here it becomes us to express our persuasion, that this part of his work is as judicious and excellent, as the physiological and philosophical part of it is erroneous and obscure.

His directions may be summed up in three words—SEPARATION, CLEANLINESS, and VENTILATION. (See p. 73, 96, 100, 104, 106, 110, 111, 112, 113, 114, 116, 117, 120, 134, 136, 165). For if the sick, who are always nasty, and generally exhale disagreeable as well as unhealthy gases, are thinned, and kept apart; if nastiness of all kinds is removed from the body, clothing, bedding, utensils and furniture of the sick; and if fresh air is freely admitted into his apartment, then all will have been done that is necessary, or possible, to destroy the septic venom. For an illustration of this doctrine, in regard to the *plague* of Asia and Africa, see the paper in our appendix, which we hope will rectify some mistakes upon this head under which Dr. H. seems to labour. (p. 122).

No reader that is acquainted with the history of the *nitrous fumigation*, can avoid remarking the polite and delicate manner in which Dr. H. tells the celebrated discoverer of that

fallacious mode of destroying contagion, that he has made no trial of his process, and that, from long observation, he is satisfied contagion can be readily and completely destroyed without it solely by purification and fresh air (p. 97). Smyth's nitrous fumigation never obtained any credit in America. When HAYGARTH so ably seconds the motion of TROTTER, it is not likely that it will much longer have any adherents in Great-Britain.

As cleanliness is enjoined upon all mankind by moral obligation as well as medical precept, we shall enforce Dr. H.'s injunctions to this point by offering a detail of the several processes for accomplishing that valuable and important object. From this it will appear, on analysing the subject, that the four great agents in removing nastiness and infection are, CLEAN AIR, CLEAN WATER, ALKALINE SALTS, and CALCAREOUS EARTH. *Cleanliness* and *ventilation* are in every body's mouth, yet very few, on account of the complexity of the ideas the words convey, have any precise and definite conception of what they mean.

Cleanliness is the removal of excreted fluids, and the new compounds formed of them, from the persons, clothing and habitations of men. If a man, and a marble statue as large as a man, be kept in the same chamber, the man will become unclean much more rapidly than the statue. The latter may receive dust, smoke, or foreign particles of other kinds *from without*, but will not become nasty from any internal cause. Not so with the former; his living body, which has been long ago, and very justly, compared to a smoking dunghill, incessantly emits, during life, exhalations foul enough to soil linen, and rank enough to be smelled by dogs. The accumulation of these in the pores of the cuticle, and every where about the cuticle, makes it nasty and uncomfortable, and very often renders it the seat of disease, as of the itch, blotches, sores and pimples. If this nastiness is not washed or wiped off, so as to be removed entirely from the body, it will be wiped off by the shirt and other clothing constantly in contact with the body, and will infect that clothing with its peculiar taints, sticking to all its threads and filaments. And whenever sheets and bed-clothes have been saturated with the excreted discharges wiped from human bodies, they also are uncomfortable and unhealthy. Among poor and negligent people in all countries, this animal matter surcharges their cuticles, clothes and beds; and, in the heat of about 96 deg. of Fahrenheit's scale, the ordinary heat of the human body,

the moist ingredients with which the body and bed-clothes are charged, though not poisonous at first, are, by chemical and putrefactive action among themselves, changed in part to septic acid or pestilential air.

Among the poor and wretched inhabitants of the large manufacturing and commercial towns of Great-Britain, a blanket is sometimes put upon a bed, and kept there, without washing or changing, until it is worn out. The like happens to some articles of brown or black colours, which, after being put on, are never washed as long as they will hang together. In the narrow, sequestered, forlorn, unalkalized, and unventilated abodes of these persons, a poison is engendered, which often kills the people from whose excretions it is produced. The reader will recollect that it is not affirmed, for it is not true, that the excretions of these poor people of whom we are writing are commonly poisonous *at the time* of their secretion. On their *first* formation they are as free from *actual noxiousness* as the excretions of other people. But in their unhappy situations, the long accumulation and detention of the same nasty materials which befoul a shirt or a blanket, will turn to pestilence, and infect the atmosphere of a whole apartment, tenement or house.

The point particularly worthy of notice in this statement is, that the septic poison *is not secreted such* from the mouths of the exhaling arteries; but that common secreted matter, having originally nothing directly venomous, *changes by degrees to a poison, by being, after secretion, exposed to the atmosphere in a heat* equal to that of the human body.

This inanimate matter is of four different sorts: 1. *Matter vomited up* in times of sickness, both at sea and on shore, and left adhering to the floors, bedding or clothing; a very common case. 2. *Matter discharged by stool*, in cases both of health and sickness, and tainting floors, utensils, clothing and bedding; an occurrence unavoidable where there is a family of children, and frequent enough among grown persons, especially when infirm or sick. 3. *Matter discharged from the urinary and sexual organs*, more or less of which inheres to clothing and bedding. 4. *Matter discharged by perspiration*, happening to all human beings every moment of their existence, and sufficient, of itself, when accumulated and concentrated, to produce the most active and malignant poison. But the statue has none of these evacuations, and therefore remains clean.

The sufferings of men, in the early stages of society, from

the collection of these excrementitious things around them, were excessive. The diseases incidental to their uncleanliness among the Jews, gave rise to many strict regulations and ceremonies in the Mosaic Law. Almost the same nasty way of living still continues among the common people of Syria, Egypt and Barbary. By a change in their religion, they have thrown off the Jewish and adopted the Mahometan faith, much to their detriment; for they are not now under equally rigid injunctions to keep their *clothes and their houses* clean. The degree of nastiness among the ancient Hebrews induced a distemper which they called *leprosy*. The greater degree of it, prevalent among the modern Syrians, Egyptians and Natolians, produces what they now call *the plague*. Among the English, the circumstances of climate and constitution under which their nastiness is worked up to poison, make it constitute a disease among the emaciated poor, which they call *typhus*. When engendered in sea vessels, from similar materials, it is denominated *ship-fever;* when in prisons from the like causes, they call it *jail-fever;* when in crowded and badly managed infirmaries, it is known by the denomination of *hospital-fever;* and when, in addition to somewhat of domestic uncleanness, the septic acid vapours of corrupting beef, fish, hides, offal, and the like, in the cities of North-America, are made to operate, under an intense heat, upon human constitutions, the malady produced has been called *yellow fever*.

How, then, the reader will ask, is the wide-spreading and sore-wasting mischief to be arrested? Being bred in contact with our bodies, and clinging to our very skirts, how can it be made to unclench its gripe or quit its hold? Experience, the mother of all useful inventions, has sufficiently shown how this can be done. *Pure air* is one of the most easy, cheap, and obvious expedients for thinning and carrying away infectious fluids when they exist in an aërial form. *It is the nature of infectious fluids to diffuse themselves around and among the surrounding bodies until they impregnate all alike, and thus find their level.* If clean atmospheric air is admitted into an infected apartment, a portion of infectious gas will join the admitted portion of atmosphere, and thereby the contaminated air will be rendered more dilute or less concentrated. And if this clean air is made to pass through in a stream or current, the infectious gas mingling with it may be wafted away, and be so attenuated, and removed so far, as to do no more harm. The operation of a clean fluid,

when applied to a firm or solid body in a nastier state than itself, is called *washing*. Clean air, passing by and through infected clothing and rooms, washes away a part of their filth. This might very significantly be called AIR-WASHING, as the application of it to the human body has been aptly called the AIR-BATH. In ordinary language, however, this process of washing through the medium of an aërial fluid has been known by the name of VENTILATION.

But cases occur where VENTILATION, or WASHING WITH AIR, is either not efficacious or not expeditious enough. The nastiness and infection are either not washed out completely by it, or are removed too slowly for ordinary convenience. In such instances PURE WATER is a good auxiliary to PURE AIR. Septic poison, or, what is the same thing, infection, is disposed to diffuse itself, and find its level in clean water very readily, as well as in clean air: and water is better adapted to attract to itself, and carry away with it, gross and unvolatile matters, than air is. For the removal, therefore, of those thick, unctuous, and adhesive excretions, which do not quit their connection with the cuticle and garments, and rise in vapour, WATER has a more exact and determinate fitness than air has. Water has for this reason been, by the common usage of mankind, employed for this purpose; and the operation has been called WASHING, or, as it ought more properly to be expressed, WASHING WITH WATER.

If mankind wore few clothes to collect and confine their nastiness about them; if they lived in temperate latitudes, under open sheds, with little bedding and furniture; if they frequently used both the AIR-BATH and the WATER-BATH; and if they fed moderately upon food chiefly vegetable, whereby their excretions would be diminished in copiousness and rankness, as the natives of Otaheite seem to do; perhaps these two kinds of washing would answer most of the purposes of ridding them of their personal and domestic nuisances.

But with the greater part of the human race the case is widely different. Their shirts, breeches, stockings and coats, cover them by day, and their feather, flock or straw beds, sheets, blankets and coverlids, invest them by night. Their dwelling-places are often close and narrow: and only now and then, by way of a rarity, are the persons, clothes, beds, bedding, furniture and chambers of these families, WASHED AS THEY OUGHT TO BE, EITHER BY AIR OR BY WATER.

The condition of such mortals was unhappy to be sure.

Doomed to exist, without the purifying streams of God's free gifts of air and water, sickness and abridgment of life were the unavoidable consequences. But this situation, though for a while deemed forlorn and desperate, was found, by experience, to be susceptible of great alteration, and even of comfort. In the abundant stores of the Almighty, men at length discovered that great quantities of ALKALINE SALTS AND EARTHS had been treasured up for their relief. And they have since found that the processes for keeping up the stock of these articles will be as durable as the existence of fire, which prepares pot-ash and soda by the incineration of plants, and as lasting as the labours of shell-fish, which collect lime from the floods of the sea.

Asia seems to have been the cradle of mankind; though Egypt, a north-eastern corner of Africa, was, perhaps, the best seminary of learning in early ages. The power of alkalies to prevent corruption, to repress noxious vapours, and to give activity and dispatch to water in removing nastiness from the human skin and clothing, had undoubtedly been discovered as long ago as the descent of the grandson of Abraham to that country. There were natural circumstances in some parts of that region peculiarly favourable to these discoveries. The surface of the land abounded with calcareous rock and brine of sea-salt; and these, acting upon each other, underwent a double decomposition, whereby the carbonate of lime and the muriate of soda were changed to a muriate of lime and a carbonate of soda. This carbonate of soda lay ready to their hands in the dry season, and required little more than to be scraped together for use. Its *effervescing quality*, when the acetic acid, or vinegar, was poured upon it, is noticed by King Solomon, who flourished one thousand years before the birth of Christ; and its *cleansing power* is remarked by the Prophet Jeremiah, six hundred years prior to that era. So early was it known that the most comfortable and healthy consequences arose from ALKALIZING water, or rendering it ALKALINE.

This discovery, which was of more consequence to the physical purity, and through it to the moral proficiency and excellence of man, than the invention of the alphabet, has come down to us without its author. It belongs to some Memphian genius, whose name ought to be mentioned with those of Theban Hermes, and Syrian Cadmus.

Such a solution of soda in water was called a *lixivium* or *ley*, and afterwards all salts capable of forming a solution pos-

sessing such antiseptic, detergent, neutralizing, and sweetening qualities, were distinguished as *lixivial salts.* The theory of their operation is briefly this: soda (and the same is true of pot-ash) has a double property of neutralizing acids, and of rendering grease soluble in water. A portion of greasy as well as infectious matter inheres in garments, &c. which neither mere *air* nor unmixed *water* can wash away. But no sooner is water charged with an alkali, than, like a peace-officer authorized by a warrant, it searches every suspicious corner and lurking place, and drags forth mischief with its aids and abetters from their concealment.

Water thus to be rendered quick, safe and efficacious, ought to be *alkalized.* But as soda is not every where to be got, or if to be purchased, costs too high a price for common use, POT-ASH began to be employed in its stead. Pot-ash was gathered on every hearth where wood was burned; and in process of time it began to be understood that whosoever kept a wood-fire, to obviate the evils of cold, and guard against the severity of hunger, would find in its ashes a sovereign antidote against nastiness, infection and pestilence. Water, therefore, was alkalized with *pot-ash*, and this *lixivial salt* was substituted for soda in the business of removing corrupt excretions.

Experience, however, soon taught that pot-ash, taken hot from the fire-place, was of a caustic quality, and preyed upon the skin and flesh of those who put their hands into a ley made of it. Garments, too, soaked or boiled in this acrid lixivium, were sometimes rendered rotten, and fell to pieces on being handled afterwards. To secure the hands and the goods at the same time against this destructive alkali, another expedient was tried, and another discovery made. In almost every house, whether of a huntsman, a shepherd, or a cultivator of the earth, there were scraps and morsels of fat and other animal substances not consumed as food, and these often lay as incumbrances about the house, or were wastefully thrown into the fire. Now it was found that they might be employed for a very important domestic purpose; for the ley of the caustic pot-ash would combine with them, and in so doing there would be formed from the two a new product, possessing all the detergent and alkalizing powers of the pot-ash as respected the garments, without its corroding and disorganizing effects as regarded the hands of the washer. Thus *soap was discovered;* and such is the reason why its alkali is connected with and disguised by grease or oil.

The great and efficacious means of cleanliness are therefore

found to consist in WASHING; with, 1. Clean air: 2. Clean water: 3. Water alkalized with soda: 4. Water alkalized with pot-ash: and, 5. Water alkalized with soap. And these, when seasonably and sufficiently employed, are capable of overcoming and removing every particle of nastiness, septic acid, or infection, which are engendered on the cuticle, in the clothing and bedding of men, within their habitations, and amidst their furniture. These agents are sufficient to prevent its formation, and to destroy it wherever it exists. And wherever infection arises, as on ship-board, in poor-houses and jails, in hospitals and camps, there is always a neglect of these ventilating and alkalizing processes which make pestilence vanish before them.

We come now to the second part of the work, which is addressed, the reader remembers, to the College of Physicians of Philadelphia, on the prevention of the American pestilence. In this he applies his opinions concerning the imaginary typhous contagion, to explain the origin, progress and prevention of what he deems pestilential contagion. Having offered our reasons for disbelieving altogether the existence of contagion in typhus, we shall not repeat what we have frequently published against the presence of contagion in yellow fever, but refer our readers to the passages. (See Med. Rep. vol. iv. p. 167. vol. v. p. 72). We agree with Dr. H. that the two distempers are analogous cases. Though we do not say, with him, that typhus is contagious, and, by analogy, yellow fever is contagious; but we being convinced, and that conviction strengthened by Dr. H.'s own evidence, that there is no contagion in the former, are also convinced, by parity of reasoning, that there is none in the latter.

In a strain of deep concern, he laments the evil hour when Dr. RUSH ascribed the distemper of Philadelphia, in 1793, to local and domestic causes (p. 146). He pronounces that the ACADEMY OF MEDICINE in Philadelphia have alledged the most frivolous, inadequate and groundless causes of this calamity (p. 147). He charges Dr. CALDWELL with great declamatory parade, bold assertions and flowery diction, and of self-contradiction and condemnation (p. 151). He affirms that such vague and ill-founded notions have obstructed the measures of government in all the sea-ports of America (p. 153). He is sincerely sorry that Mr. WEBSTER should publish such whimsical and irrational opinions as are contained in his History of Pestilential Diseases (p. 155); and observes, "that an author of this kind would require no notice, if the positive and plausible style of his book did not occasion ap-

prehensions that it might mislead the unwary reader." (p. 157). To the disingenuous spirit of these observations we make no reply, as the injured gentlemen concerning whom they are made are more able than ourselves to justify their opinions, or to recriminate.

With the kind intention of counteracting, as far as in him lay, the tendency of these doctrines, Dr. H. wrote to his very intelligent correspondent, Dr. WATERHOUSE, asking a number of questions about the pestilence in the United States, and extolling CHISHOLM's book of positive declarations as a most intelligent account of it in the West-Indies. Dr. Waterhouse waved or evaded a direct reply, by writing that he could not gratify him by giving answers to his interesting queries, on account of the contradictory state of medical opinion. Frustrated in this attempt, twice made (in 1798 and 1799), to obtain the requisite information from the worthy professor at Cambridge, Dr. H. addresses himself, as a last resort, to the learned College of Physicians in Philadelphia, and accompanies his letter to them with a copy of the letter so unsuccessfully sent to Massachusetts. And to encourage them to do something, he informs them he has deliberately and impartially considered their pamphlet (reviewed in Med. Rep. vol. ii. p. 404), and "has been convinced, by the clear, consistent, and complete evidence which they have adduced, that the contagion was introduced into America from the West-Indies," &c. He calls upon them as a society, constituted by government, with a peculiar duty to discover the nature of this contagion, and the laws by which it is propagated, and to advise regulations for its prevention. He solicits them to appoint a committee of inquiry for the purpose, and to write him full and explicit answers to his queries; and observes to them, "that none but active and zealous members, eager in the pursuit of improvement, ought to engage in the undertaking."

We are pleased with the seasonableness and solemnity of this exhortation, and hope it will produce the desired effect upon the respectable gentlemen to whom it is addressed. The HOUSE OF CONTAGION claiming title as sovereign, by descent and prescription from a long line of ancestors, over vast territories in the medical world, is losing its popularity and power, like some other great houses. Its dominions are in a tumultuary condition, and several of them are in a state of open heresy and rebellion. The large and populous provinces of FEBRIFLAVA, PESTIS, DYSENTERIA, and TYPHUS, have already abjured the authority of such usurpers and tyrants, and

have declared themselves free and independent. These unexpected and daring events have spread uneasiness and alarm throughout the whole realm; and where the encroachment and evil example of these undutiful subjects may end, cannot be conjectured even in the cabinet. Nothing is thought of but a dismemberment of the empire; whereby, if the CONTAGIONS are not wholly dethroned, they will be deprived of at least more than half of their ancient and hereditary possessions.—To oppose the bold and active leaders in these innovations, it becomes all the friends of the old establishment to rally. Not a moment is to be lost: for by tardiness and neglect, it is certain the opportunity of reuniting these disaffected provinces under their former head will be irretrievably gone. It is by vigorous proceedings alone that an end can be put to the prevailing turbulence and division; yet these must be tempered with much prudence and forbearance; for too much vigour, like the energetic conduct of ALVA, the vicegerent of PHILIP II. will be the most effectual method of accomplishing the very event it was intended to frustrate.

In the interim, while these things are resolutely doing, and under such happy omens, for the good of the cause, we take our leave of this work, by recommending to its ardent and inquisitive author the accounts of the *local origin* of the distemper at Boston, by Drs. Rand and Brown (Med. Rep. vol. ii. p. 360, 442); at New-London, by Drs. Channing and Coit (ibid. p. 372, 375, 377); at Baltimore, by the medical faculty there (ibid. vol. iv. p. 351); at Norfolk, by Drs. Selden and Whitehead (ibid. p. 329); at Charleston, by Dr. Ramsay (ibid. p. 217); important collections of testimony, of which he seems to be entirely ignorant. We refer him also to the facts proving its *local origin* in the interior of New-York and Pennsylvania, and the western country on the Ohio (ibid. p. 73, 74, 75), without a suspicion of importation; and to the history of its *local origin* on board several ships in the American navy (ibid. p. 1, 234, 244); and in the port of Cadiz, in Spain (ibid. vol. v. p. 103); and lastly, the facts related by Dr. Vaughan (ibid. vol. iv. p. 45), and Dr. Barker (ibid. p. 149), and the too much neglected publication of the late Mr. Bayley, on the Yellow Fever of New-York in 1795, may serve to augment Dr. Haygarth's deficient stock of knowledge.

ART. III. *Medical and Physical Memoirs, &c. By* Charles Caldwell, *M. D. &c.*

[Continued from p. 66.]

MEMOIR II.—*Facts and Observations relative to the Origin and Nature of the Yellow Fever.*

THE principal part of this memoir, which is comprised in ten numbers, and addressed to the citizens of Philadelphia, was originally published in the autumn of 1799. The chief points which the author endeavours to establish are the following: I. That the late malignant epidemic of the summer and autumn, in Philadelphia and other cities of the United States, was not a contagious disease. II. That consequently it was not an imported disease. III. That it was only a modification or more malignant grade of the common bilious fever of our country. IV. That it was essentially different from the typhus mitior, or jail-fever.

Dr. Caldwell's reasons for disbelieving the contagiousness of yellow fever are—1. The existence of a similar disbelief among the most experienced and enlightened physicians of the West-Indies, as well as among a great majority of those of the same description in our own country. 2. Its not spreading in the country, nor even in towns beyond the range of vitiated atmosphere. 3. The immediate extinction of the disease by frost. 4. The want of a specific character, and definite period as to the duration of the disease. And, 5. The indefiniteness of the interval of time between the reception of the poison and the commencement of the disease.

Dr. C. rejects the importation of the yellow fever, and asserts the origin of it from domestic sources on the following grounds: 1. Because it is not a contagious disease, and, therefore, must be incapable of importation. 2. Because it was never introduced into Philadelphia from the year 1762 till 1793; notwithstanding the want of quarantine regulations during an extensive and uninterrupted intercourse with the West-Indies. 3. Because it has never been conveyed into Britain or France, notwithstanding the exemption of West-India vessels from the restrictions of quarantine in all the ports of the mother countries. 4. Because all attempts to trace the importation of the disease, and to ascertain the channel of introduction, have proved unsatisfactory and abortive. 5. Because it is the constant product of putrefaction in other warm

climates abounding in vegetable and animal filth, and, therefore, cannot fail to result from the same cause, under the tropical temperature of the summer in this country. 6. Because it has never been known to prevail in this country, except during those months in which, from the influence of preceding heats, the atmosphere has been loaded with putrid exhalations. 7. Because the yellow fever prevailed among the aborigines of this country prior to the existence of commercial intercourse with the West-Indies, and now is known to prevail in many places remote from maritime situations.

Dr. C. supports the opinion, that yellow fever is only a higher or more malignant grade of the common bilious fever of our country, by stating that these diseases appear and disappear at the same seasons of the year—that they appear only in situations of the same description, being confined exclusively to such as abound, more or less, in putrid exhalations—that persons of the same description are most liable to the attack of each—that they are ushered in in the same manner, exhibit symptoms differing only in degree, and commit their principal ravages on the same organs and parts of the body—that they often give rise to the same forms of chronic disease—that they may be reciprocally converted into each other—that they are alike destitute of the power of contagion—that the progress of both these forms of disease has been, at times, arrested by a continuance of dry and warm weather—that they frequently prevail in the same place at the same time, and, therefore, under the same constitution of atmosphere—and, finally, that they yield to the same remedies, modified and urged with different degrees of force, according to the state and grade of the existing disease.

We are glad to find that Dr. C. in the course of his reasoning on this subject, has so pointedly availed himself of the inferences to be drawn from the sudden disappearance of yellow fever after the coming on of frost. To our minds, this extinction of it by cold has always appeared to be a pregnant and instructive fact, deciding its real nature and origin more positively, perhaps, than any other which can be adduced. This fact must establish the generation of it by putrefaction, and proves, moreover, that its epidemic appearance arises from a general vitiation of the atmosphere within certain local ranges, produced by that extensive surface of putrid matters which overspreads our docks, slips and wharves, and bestrews our streets, back-yards and cellars, and not from any thing engendered in or issuing from the bodies of the sick, or

the chambers in which they lie. On this supposition the extinguishing power of frost may be easily understood; for the effect of it in arresting putrefaction is well known, and it is equally known, that to all such sources of putrefaction as we have just mentioned, frost finds ready access. Hence, too, we can explain the fact so often observed, that multitudes take the disease who merely live in or frequent certain pestilential streets or situations, without seeing or approaching the sick, the clothes or bedding of the sick, any other substances imbued with their exhalations, or the vessels pointed out as the source of the imported contagion.

But in attempting to derive yellow fever from human contagion, how shall we account for the sudden disappearance of it after sharp frost? Contagious diseases are not subject to extermination by such a power. When cold weather comes on we close our rooms, we increase the quantity of bed-clothes, and we excite artificial heat by the burning of fuel. Our bodies, preserving a uniformity of temperature throughout all seasons, suffer no abatement of heat at the arrival of winter; we keep our apartments comfortably warm in the most rigorous weather; and patients labouring under yellow fever at the conclusion of the epidemic season, by additional weight of bed-clothes, and by the heat of fires kindled in their chambers, find a compensation for the atmospherical warmth which no longer exists. What, then, can be the operation of frost in such apartments, and upon the bodies of such persons? Why do not the sick, immersed in such a degree of heat, continue to communicate their disease to all or to most of those who approach their beds? And why is not the disease, in this manner, continued by succession from one person to another throughout the whole winter?

This principle will be confirmed and illustrated by contrasting the extinction of yellow fever by frost with the increased prevalence of typhus or jail-fever during winter. The latter disease chiefly springs from the condition of things within doors, as the former principally from the state of the air out of doors. The one may be generally ascribed to the defects of domestic economy—to the poverty, filthiness and crowdedness of private families; the other to the neglect of police regulations calculated to secure the public health. The exhalations, and other excretions of the human body, confined, accumulated, becoming putrid, and thus emitting a poison which adheres to the skin, clothes, bedding, furniture, utensils, walls, &c. generally give origin to typhus among the

crowded inhabitants of small, low and filthy dwellings; while larger masses of putrefying animal and vegetable substances, overspreading greater space, and thereby vitiating extensive portions of the atmosphere, produce the epidemic prevalence of yellow fever as it rages in cities, or in certain spots of the country. The heat of the human body, operating upon the filth of collected excretions, unopposed by the diluting and cleansing processes of ablution and ventilation, produces, on the small scale of a crowded room or house, results in many respects analogous, but in some other respects dissimilar, to those observed on the large scale of a city, where vast masses of putrid matter are acted upon by the sun. In both cases a fatal poison is generated. In the case of typhus, the poison, originating from filth accumulated within a small space, reaching and adhering only to whatever lies in contact or very near to it, can spread only to the distance of a few feet from its source, and, consequently, can never produce an epidemic disease. As typhus likewise depends upon animal heat, aided, perhaps, occasionally, by the heat of a fire, upon want of cleanliness, which may equally exist at all seasons, and upon want of ventilation, which is more apt to be carried to an extreme in temperate than in hot climates, and in cold than in warm seasons, it is not extinguished, but rather acquires additional vigour in winter. The reverse of all this happens in the production of epidemic yellow fever. Putrefaction from numberless sources, fed by a never-failing supply of dead animal and vegetable filth, expanding a surface of vast extent to the heat of a burning sun, generates, in this case, a wide-spreading poison, which can only be extinguished by frost sharp enough to destroy the existence of its parent.

Hence we may satisfactorily account for typhus being generally a disease of temperate or cold climates, seldom appearing within the tropics, and often committing its greatest ravages in the winter; while yellow fever is a perpetual endemic within the tropics, especially to new-comers, and in more temperate regions can only rage as an epidemic in summer and autumn, and is immediately arrested by the cold of winter. Hence, too, we may explain why typhus chiefly attacks the weakly, more frequently females, and especially such as suffer from a deficiency of nourishment; while, on the other hand, yellow fever makes prey of the robust, vigorous, active, plethoric and well-fed part of the community. Hence, likewise, we can understand why typhus never spreads as an

epidemic, through whole cities or tracts of country, banishing all other diseases, or imperiously forcing them to assume its symptoms; while, at the same time, we obviously comprehend the tendency of yellow fever to exhibit all these remarkable phenomena. On the same principles also we account for the slow and gradual approach and chronic duration of typhus; as well as for the rapid onset and quick termination of yellow fever.

In the fourth place Dr. C. offers his reasons for asserting an essential difference between typhus and yellow fever. A principal ground of difference, which he labours to establish, besides those which we have already mentioned, is the contagiousness of the former; a point in which our readers will recollect that we have formerly stated our dissent from this respectable writer.* He [illegible] supposes the contagion of typhus to be the result of a *morbid* secretion. But is it not difficult to reconcile this supposition to the fact of the wretched inmates of dungeons infecting those who approached them, when brought out into public, while they themselves had remained without *disease?*†

(To be continued.)

* See Med. Rep. vol. iv. p. 408.

† As it happened at the Black Assizes at Oxford in 1571, and on several occasions since that time.

Dr. Haygarth himself, the great apostle of febrile contagion, admits that a typhous patient, removed from the filthy dwelling where the illness was contracted, stripped of infectious clothing, thoroughly washed and cleansed, and lodged in a spacious and ventilated chamber, seldom or never communicates contagion to such as approach his bed. Does not this fact greatly resemble the acknowledged non-contagiousness of yellow fever, when the patient is carried out of the range of vitiated atmosphere into the pure air of the country?

[*Letter to Dr. Percival on the Prevention of Infectious Fevers.*

MEDICAL & PHILOSOPHICAL NEWS.

DOMESTIC.

Experiments, Facts and Observations in Natural History, made during the Autumn of 1801, *by Samuel L. Mitchill.*

1. EXPERIMENTS AND OBSERVATIONS ON THE BLACKNESS OF BODIES, SHOWING THAT BLACKNESS IS NOT PRIVATION OF COLOURS.

AS I was making some experiments the other day with a small thermometer upon bodies of different colours, exposed to the rays of the sun, then shining very bright, I was struck with an appearance I had not so particularly noticed before on the surface of *black* bodies. As my thermometer was lying on the black hair-cloth bottom of a mahogany chair, near the window, in the sunshine, I observed the white light or sunbeam, so refracted as to exhibit the prismatic colours, and reflected, after refraction, plainly to the eye, while those parts of the cloth which were not so brightly illuminated, or which were not exposed to the direct rays of the sun, appeared of the ordinary black colour. On moving these black or feebly illuminated parts of the hair-cloth into the sunshine, they likewise reflected prismatic colours; and, on withdrawing them into the shade, the light was refracted and reflected too feebly to be distinguished into colours, and they returned to their former blackness. The quick-silver of the thermometer, lying on the hair-cloth which so refracted the sun-beams, and reflected their prismatic colours, had risen to a height many degrees above the temperature of the parts on which, by reason of feeble refraction in the shade, no colours were distinguishable by my eyes.

Here, then, was a confirmation of the common experiment of heat accumulated in *black* bodies exposed to the solar radiance. And there was more than that: There was evidence plainly submitted to my sense of seeing, that a certain black body did not absorb the white or undecomposed rays of light, but did decompose them in a considerable degree, and reflect coloured light of all the iridescent hues to the organ of vision.

To know how far this quality of black horse-hair corresponded with other black substances, I exposed *black silk* to the sunshine, and saw the prismatic colours plainly on its filaments. I then examined the *black bristles* of swine, and beheld a similar reflection of colours from their surfaces. Afterwards a *black dyed hat* was exposed to the rays, and rainbow colours were reflected from the sides of the *fur* and *hairs*. Also *black leather* boots, and a *black paper* snuff-box, were iridescent in the sunshine. The like was observable of *black varnish*, the polished surface of which, in the sunshine, was prismatic too. *Black wool* and *woollen cloth*, subjected to the light in the same manner, gave a like result. A *black ink-stand* and a *seal*, of *Wedgwood's earthenware*, decomposed the sun-beam, and reflected rainbow colours too; and these, like the rest, when removed beyond the limits of distinct vision, affected the eye with a sensation of *uniform blackness*.

What, then, is this *black*, which the Newtonians teach to be a negation or privation of all colour? Why, truly, a very different state of things indeed. So far is a black body from being the absence of all colour, that its peculiar complexion depends upon its being a co-existence of all the rainbow colours. These had undergone refraction on innumerable points, angles or roughnesses of an almost infinite smallness. Therefore, these coloured rays being too small, or possessing individually too little of the matter of light to be vivid, and being too much confused with other colours to be seen distinctly, make up, by their joint operation, the *mixture of colours* which is called black. All coloured bodies possess the power of refracting light in a certain degree, and of reflecting some or other of its hues; and, of all bodies with which we are acquainted, those which are denominated black affect this separation of colours in the most complete manner, by a more minute and exquisite subdivision, and a more scattered and mingled reflection than other bodies present.

White has been defined, by the natural philosophers, to be the presence of all colours, and *black* their absence. It would be much more correct to say, *White is the reflection of solar rays in their compound or undivided state; while* BLACK *is the reflection of the same rays after an almost infinitely small resolution or decomposition:* Or, *white* is the absence of all distinct and sensible colours, and *black* is the presence of all: Or, again, *white* is the effect of *heterogeneous*, and *black* of *homogeneous* light.

The fine experiments of Dr. Herschell have shown, that white light, after undergoing the operation of the prism, emits heat; or, in other words, its *illuminating* rays are accompanied with *calorific* rays. This I suppose to happen thus: Light is a fluid, and, like other fluids, owes its fluidity to latent heat: whenever the composition of this compound of light and caloric is severed by the prism, a considerable portion of caloric is disengaged, and passes from a latent to a sensible state. And agreeably to Count Rumford's doctrine of heat reflected in strait lines from bright surfaces, this disengaged caloric is of the radiant kind.

But the glass prism and the watery rain-drop are not the only bodies which untwist the white sun-beam. All coloured substances effect the same in part; but the deepest black accomplishes the work most completely, and shows, by themselves, all the delicate and slender threads of that wonderful cord. The spots on the top of Newton's soap-bubble, appearing in the midst of the prismatic circles which are so bright and beautiful, have been supposed to be analogous facts. These spots, however, are not *black*, but perfectly pellucid: they permit light to pass through without reflection, and are the same that the pupil of the eye would be was there no black pigment within the choroides. The *prismatic spectrum* and the *rainbow* present the primitive colours in succession, according to their respective refrangibility: *black bodies*, on the contrary, exhibit them without such regular sorting or classification, confusedly as they happen to bespatter the surface.

There is an experiment of Newton's so pointed and unequivocal, that it is wonderful that great philosopher did not interpret it as it ought to have been: I mean the decomposition or the division of heterogeneous light, and the splitting it into its homogeneous parts or colours by the fibres of a black ribbon held between the eye and the sun. In this experiment the white or compound ray is most elegantly divided by passing through the silk into its prismatic colours, and reaches the retina entirely divested of its glare or splendour. The prismatic colours most beautifully embellish the cloth. During this process, the latent heat of the sun-beams being disengaged, and exhibited in a sensible form, becomes capable of raising the quick-silver in thermometers, and augmenting the temperature of other bodies. Hence black, which has the greatest power to shatter, split or dissever the white or heterogeneous rays of the sun, is the warmest of all co-

lours, by virtue of the larger proportion of sensible caloric disengaged from those rays. The different shades of black are warm in proportion to their capacity of decomposing sun-beams, and separating latent heat from them.

It is a mistake that black bodies absorb all the rays of light. Although it has been made an optical aphorism "that the blackness of bodies proceeds from their incapacity to reflect any of the rays of light," yet it is certain that light is reflected from some black bodies, as black bottles, black marble, black leather, &c. very powerfully. Black may then reflect light; and, when this happens, the bodies so constituted are proportionally cool, because they send back the sun-beams entire, without abstracting their caloric.

When many sun-beams are condensed in the focus of a mirror or lens, and thrown upon an opaque inflammable body, so much light is decomposed, and so much caloric extricated in a small spot, as sometimes to set it on fire. This effect evidently proceeds from the caloric separated from fluid light, and assuming a sensible or thermometric form.

These observations and experiments are intended to reconcile certain difficulties in Sir Isaac Newton's doctrine of light, to show how Dr. Herschell's experiments may be interpreted, and to give a proper idea of that condition of bodies denominated *black*. As to Lewis's numerous experiments on black, in his history of colours (Philosophical Commerce of Arts, p. 315 & seq.), they are not devised in such a manner as to throw light on the constitution and theory of this colour, but merely to improve and economize processes in the arts where *black* is employed.

Sept. 16, 1801.

2. REMARKABLE SERPENT (BOA CONSTRICTOR) KILLED ON LONG-ISLAND.

On the 28th of September, 1801, a serpent, of a species unknown to the people of the neighbourhood, was killed in a swamp at Islip, in Suffolk County, New-York. They had no vulgar name for it. Its length was seven feet and four inches, and its thickness proportional, being around the swell about the size of a man's wrist. It was on the belly and sides of a yellowish or straw colour. On the back were thirty-six black spots, reaching in a row from the head to the tail; and on each side of this row, approaching the belly, were many other blackish or dark brown spots. These gave it a speckled appearance, and there were no stripes. It had

no fangs or biting-teeth to pierce the bodies of its enemies, and insert poison; and, therefore, was not venomous. In the lower part of the mouth there was a considerable fleshy portion like a tongue, which terminated in a long bicuspidated projection. The jaws were furnished with hooks or hamated teeth, in the manner common to snakes. It had scuta both on *the belly and tail;* and these amounted to about *three hundred.* From these characters, it appeared to me, when I examined the serpent soon after it was killed, to belong to the genus of BOA. The number of the scuta so exactly corresponds with the species termed CONSTRICTOR, that the *boa constrictor* may be enumerated among the American serpents. This is the creature which is said to grow in India to the length of thirty feet and more, and to crush animals to death by twining around them; though in the United States it is not yet known to grow to so large a size.

3. BEAUTIFUL SPECIES OF SOLANUM FOR FLOWER GARDENS.

Several species of the numerous family of solanum are already in the gardens and green-houses. To say nothing of the common nightshade and potatoe, it may be remarked, that the *egg-plant,* the *Jerusalem cherry,* and the *bitter-sweet,* have attracted no small share of attention. The species which are cultivated for the purposes of taste and ornament are valued not for the beauty of the blossom (for the flowers of the solanum are not remarkable for their gaiety), but for the agreeable habit and aspect of the whole plant, or for the singularity of its fruit. The mature pericarpium of some of the species bursts open, and gives an appearance quite as handsome as petals, pistils and stamens, and greatly more singular and durable. The *solanum dulcamara,* about the time it drops its leaves in October, opens the high *orange-coloured* trivalvular capsules of its berries; and these retracting, disclose the scarlet trilocular pulp in which the seeds are enclosed. And clusters of these smooth disparted berries, dependant from their *green* foot-stalks, have been employed to make a fine and showy appearance on chimney-pieces, among dried flowers, during the whole winter.

But there is a more beautiful species than this, growing not in the form of a vine or scandent plant, but of a delicate little shrub. Its bark is green, its twigs slender and flexible, its leaves dark green, and much like those of the Jerusalem cherry. In its wild state it grows from three to five or six feet high.

It was discovered in a swamp in North-Hempstead, on October 16, 1801, in full maturity. The shrub is perennial, and bears, like other indigenous vegetables, the rigour of the seasons. Its greatest peculiarity is its seed-vessel. The leaves grow in pairs on the stems; and from the axilla, on each side of the stem, a foot-stalk arises, supporting a single fructification. This foot-stalk, which is green at its origin, turns of a reddish purple about half an inch before its connection with the capsule. This is of a beautiful *crimson* colour, rough on its outside, and split into *five* equal divisions. Between the sides of these separated portions, *two purple* webs or membranes are extended like curtains. These were formerly the two internal parts of the loculaments enclosing the seeds; but now, on the expansion of the capsule, and the receding of the apices of its portions further and wider apart, they are drawn from their former central situation, and with them the seeds, which are turned completely out of their original places. But the seeds, though thus removed, do not drop off. On the contrary, they remain attached by their umbilicus to a portion of the membrane, and adhere to it with firmness enough to be handled, and carried from place to place. They are five in number, very smooth and glossy, of the size of small pease, and of the brightest orange, scarlet, or high yellowish red colour, and seem to hang from the extremities of the five points of the divided capsule.

The appearance of these *scarlet* seeds depending from their *purple* membrane, near the extremities of the *crimson* capsule, is very singular and uncommonly beautiful, especially as these gay colours are so finely contrasted with the different shades of *green* in the bark and leaves.

This elegant shrub ought to be introduced into ornamental grounds and gardens without delay.

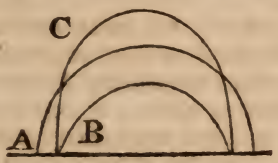
4. THREE RAINBOWS SEEN AT ONCE.

On Saturday, the 17th of October, 1801, there was a meteorological phenomenon, which I had never seen before, and which was new to others who saw it with me. The weather had been rather unsettled during the forenoon, though not stormy. There had been sunshine and cloudiness by turns. The wind blew gently from the south. A few drops of rain had occasionally fallen. At length, between three and four o'clock in the afternoon, the clouds gathered and thickened to such a degree as to threaten a considerable rain. But these appearances, in some degree, soon vanished; for there fell

only a thinly-scattered shower, which extended for several miles: but it was so trifling, that the writer of this account, who was exposed to it, was not wetted through his ordinary clothing. The rain-drops continued to besprinkle the earth until about five o'clock, when the clouds began to break away; and between them, for a time, the rays of the western sun penetrated, and shone upon the descending drops. Close behind me, sunward, was the bay, a body of water about one quarter of a mile wide.

At this juncture, towards the north-east, in the region opposite to that of the declining sun, *three* rainbows appeared. Two of them were in no respect different from common rainbows. Like them they were high, and made a wide arch, exhibited vivid colours, and these, in the *two*, were in the usual inverted order.

But the peculiarity was in the *third* bow, which was seen *between the other two, but had no parallelism with them.* It crossed the outer one at an angle of perhaps thirty-five degrees: thus, where A and B represent the common interior and exterior rainbows, and C the arch of the *third:*



The order of the colours in the bow C corresponded to their order in B: for the red rays were on its exterior part, and not on its interior, as in A.

Muschenbroeck *(De Meteoris Aqueis,* § 2437) mentions such an one as having been seen by Dr. Halley in 1698. Some appearances of the same kind have been observed by Outhier and Celsius.

Dr. Halley *(2 Lowthrop's Abridgment, &c.* p. 189) thinks the secondary arch was produced by the beams of the sun reflected from the water a little behind the spectator's back; and, in reality, was nothing more than the part of the circle of the iris, that would have been under the earth, bent upwards by reflection; but I am not of the same opinion.

Dr. Halley remembered not to have read of any such iris in any author.

5. ADDITIONAL ARTICLES OF MY REPORT TO THE AGRICULTURAL SOCIETY ON THE MINERALOGY OF NEW-YORK.

[To be added to the description of the islands. See our vol. iii. p. 325.]

(A.A.) Shelter-Island, or, as the Indian name expressed it, *Sheltered-Island*. This island, of about seven miles long and four broad, is situated in Southold-Bay, about twenty miles east from River-Head, and between the towns of Southold and Southampton. It is a distinct town in the county of Suffolk. It is higher than most of the surrounding land on Long-Island. Its soil consists chiefly of silicious gravel and grit, and a very sandy loam. The large rocks on the north side, and over the face of the land, are *granitical*, like those of the larger island, with which this was evidently once connected. They are solitary. There is a huge rock of grey *granite* within about fifty rods of the Commissioner's house on Long-Island, twenty-five feet high, and with a very broad base. In this the stratification is from N. E. to S. W. But nothing of this is discernible in the smaller and moveable rocks thereabout.

(B.B.) Hog-Islands. As a narrow current divides Shelter-Island, on the north side, from Southold, so another strait, on the south, separates it from *Great-Hog-Island*. This is rather a peninsula than a perfect island; though the isthmuses which connect it to *Little-Hog-Island*, and this latter to Southampton, are frequently overflowed at high-water. The body of these two fragments of Long-Island present very uniform appearances. The same sandy loam constitutes the soil; and, in like manner, quartz and other granitical gravel forms isthmuses and beaches.

(C. C.) Robin-Island. A small remnant of a few hundred acres lying in Southold-Bay, not materially differing from the rest.

(D.D.) Montogue, or *Montock*. A piece of land of about ten miles long, connected with Easthampton beyond the village of Ammaganset, by the beach or *Isthmus of Nepeague*. This is a low, sandy communication, and has every appearance of having formerly been upland. On the north side of it the sea has made a large inroad, called Nepeague-Bay. High tides, during storms, sometimes break over the whole isthmus. Pines, beach-plumbs, crane-berries, and a variety of other shrubs, grow upon it. Its length is about four miles. Just as you descend to it you pass a solitary rock of grey gra-

nite as large as half a hay-cock. Beyond rises the land of Montock. It is a high and uneven piece of ground; and on the south side the banks are in many places steep and rugged; for they are constantly crumbling down and wasting away, by the inland floods on the one part, and the Atlantic waves on the other. It abounds with granitical rocks and stones, though they form no regular strata; and in one place there is an appearance of reddish ochre. On its eastern extremity stands the Light-house, which is an handsome structure, of one hundred feet high to the top of the lanthern. In the vicinity of this public building the mineralogy of the place can be well observed; and feldspaths, quartzes, shoerls, micas, and their various mixtures, be plentifully gathered in the field and on the sea shore. Here the land is wasting very fast; and a part of the cliff, within a few rods of the Light-house, is so far undermined by the sea as to be almost ready to fall. From this place *Block-Island* was plain in sight, distant near twenty miles, and probably once connected by intervening land.

(E. E.) *Manchonack*, the *Isle of Wight*, or *Gardiner's-Island*, is an irregular body of land, lying obliquely between *Montock* and *Oyster-Pond* points. The body of the island, with its skirts and beaches, amounts to about three thousand acres. It is of a very irregular form, and, from one extremity to the other, measures about nine miles. From one side a long beach projects three miles northwardly towards the Gull-Islands; and from the opposite extremity, on the other side, there is a beach almost as long, which extends southwardly towards Nepeague. Thus the island and its beaches form a long and strong barrier against winds from the N. E. and S. E. and protect vessels from their violence. Within this island is a capacious and safe place for shipping to resort to, called *Gardiner's-Bay*, where there is deep water and good anchorage. It was held originally under a Massachusetts title, confirming an Indian deed, and afterwards granted anew, during the reign of Queen Ann, as a part of the Duke of York's government. By the original grant the proprietor had large powers, of the feudal kind, amounting, as some think, to the holding a Court Baron, and of enacting laws. It is now a part of the town of Easthampton. Capt. Kidd, the famous pirate, frequented this bay, and did occasionally leave some of his spoil and treasure on the island, as appears by a curious receipt, still extant, from the Governor of Massachusetts to one of the former proprietors, for a parcel of gold

and gems which he had left there, and which were seized by the government. Hence have arisen the popular tales and traditions, current every where among the islanders in these parts of America, of hidden treasure left in places innumerable by the pirates. The mineralogy of this spot is in no respect memorably different from those which have been mentioned. The stone fences on the farm are made of granitical minerals of many varieties. Here too the earth is crumbling down, and yielding to the impulse of the waves: for, besides the wasting of other parts of the shore, a part of the island, which was formerly connected with a point or head land by a high beach, has, within a modern period, been separated by the tide. The separated portion is called *Ram-Island*.—Manchonack is a single farm, managed by its hospitable proprietor, *John Lion Gardiner*, and is famous for its beef, mutton, butter, cheese and wool.

(F. F.) Plumb-Island. There can be no reasonable doubt that this detached piece of land was formerly connected with Long-Island, at Oyster-Pond point, from which it is now distant about three-quarters of a mile, in a north-easterly direction. The Indian tradition is, that the distance was formerly very small. The passage is now called *Plumb-Gut*, and is one of the great thorough-fares of navigation hereabout.

(G. G.) The *Gull-Islands* are two small portions of land and rocks, lying N. E. of *Plumb-Island*, and were apparently once connected with it, and with each other. The north-eastern-most is about three miles distant from Oyster-Pond point.

(H. H.) Fisher's-Island was claimed as a part of the Duke of York's government, and is now comprehended within the town of Southold. There is a series of rocks, reefs, and shoals in a N. E. direction from the N. E. Gull-Island, about seven miles, until Fisher's-Island begins. Evidently these are the remains of the ancient continent, which many ages ago stretched across this space. This portion of the acquired dominion of the ocean is called, on account of the violence of the currents, the *Horse-Race*, and is another of the great channels through which vessels pass. The island itself is a considerable monument of the old mineralogical arrangement, before the turbulence of the ocean disturbed its settled repose, and introduced many sad and ruinous innovations around it. It is separated from the continent, or shore of Connecticut, by a strait, called *Fisher's-Island Sound*, a third opening for the accommodation of mariners.

Of the tides in the Great Long-Island Sound it is remark-

able, that at the city of New-York its rise and fall is about six feet; at Cow-Bay, near the Commissioner's mills, seven feet and six inches, or a little more; and at Montock only two feet and one half, or three feet. Of tides in the Hudson, or North River, the rise and fall at Pollepel's-Island is somewhere about four feet; at Kinderhook five and an half feet; at Albany about one foot.

It is observable that the northern and southern divisions of the east end of Long-Island, and the whole of the adjacent isles, possess a more equable climate than any place the Commissioner has visited along the sea coast; for in the winter the great body of adjacent and surrounding ocean prevents the occurrence of considerable cold, snow falls in but moderate quantity, and the earth is not sufficiently refrigerated to keep it long from melting; and during the summer the same oceanic influence hinders the accumulation of great heat, insomuch that the ripening of wheat, flax, and other vegetable crops is between eight days and two weeks later than in North-Hempstead and the other western parts of the island. From this cause it happens that they have little sleighing and late harvests.

From River-Head, eastward, the elevation of the land is so inconsiderable that few mills are moved by inland streams; and the very moderate swell of the salt water is not very favourable to the erection of tide-mills. Water machines of these kinds are therefore so few and distant, that the greater part of the corn is reduced to meal by wind-mills.

October, 1801.

6. WEAPONS OF THE AMERICAN ABORIGINES.

Some time ago a large number of figured stones were found on the farm of Mr. Cortelyou, on the west end of Long-Island, near the Narrows. They were in one collection, and amounted to about a waggon-load. Their length was from six to eight inches, and their breath from two inches to two and a half. One end was shaped as if to be fastened to a wooden handle, and the other was rounded off, or brought to a sharp point; both sides were thinned to an edge. Such is their figure, that when fastened into convenient handles they must have made formidable pikes or spears. They were evidently intended for offensive weapons. It was at first supposed that the place where they were discovered had been the *magazine* or *armoury* of the natives; but, on further consideration, we are inclined to believe it was a *manufactory* of this sort of arms: for after examining and comparing about fifty of the stones which were

forwarded to us, we find that very different degrees of workmanship have been bestowed upon them; some being as nicely finished as the skill of the artist would permit, and others being in quite a rude state, as if they had only been roughly dressed out. The earth of which they are composed is a *black flint*, which most readily strikes fire with steel. The surface of every one of the stones exhibits the silicious concavo-convex fracture; for they have all been brought to their present forms not by grinding and polishing, but by well-directed pecking and striking. Whence the natives procured the material of which these weapons were made is not known; for none of it is found in the adjacent part of the country at this day. Upon the whole, these instruments, whether we consider them as intended to spear fishes, to transfix wild beasts, or to destroy their enemies of the human species, give a curious illustration of the state of the arts among a people not yet acquainted with the use of metals.

7. THE GLOW-WORM (CICINDELA.)

This insect (for it is such, though called a worm) is a native of Long-Island. It appeared in great numbers in September and October, 1801, in moist pasture land, beside fences and beneath locust-trees. Their light was on the tail or posterior extremity of the body, like that of the *fire-fly* or *lightning-bug* (lampyris). At times, seemingly at the option of the animal, it was kindled up to remarkable brightness. On some of the fine evenings of October, the appearance of these *glow-worms*, laying thick among the grass as we walked over it, was as that of fiery coals, and made a brilliant exhibition as they bespangled the ground.—The animal neither stings nor bites—seems very innocent, and may be handled with safety. It is apterous, is near an inch long, and much resembles the *millepedes* in shape.

8. INTERESTING PARTICULARS OF THE AMERICAN CENSUS, ENDING MAY 1, 1801.

By the enumeration of the people of the United States, it appears that the whole population (excepting Tennessee* and one allotment in Maryland) is 5,166,786, in the sixteen States, their territories and dependencies. This large amount

* The population of Tennessee is estimated at 100,000, and that of the deficient district of Maryland at 10,000; which makes 5,276,786 for the whole population of the United States. In the year 1790 the whole population was only 3,929,326; making the increase for ten years 1,347,460.

indicates a most rapid increase of inhabitants, by natural increase and by immigration. It has not been correctly found what proportion of the augmentation since the last census is made up of the swarms from the hives of Europe, and what from domestic multiplication. But we derive various other information from it; such as,

1. *That within this national territory there are more male children born than females.* The number of free white male children, under ten years of age, is 739,678: that of free white female children, within the same age, is only 694,417: making a difference of 45,261 males more than females alive at the time of the numbering; a number equal to one-sixteenth more boys under that age than girls. Hence, in the United States, the male children exceed the females in number at the rate of about 17 to 16, amounting to a surplusage of no less than 1 in 17.

2. *That there is a much more rapid expenditure and consumption of masculine than of feminine life between the ages of* 10 *and* 26. For notwithstanding the large odds in favour of males at the age of ten, the proportions are reversed before the age of 26, and there is a difference in favour of the females. Between the ages of 16 and 26, there are of males but 383,104, and of females 391,473, making an overplus of females equal to 8369, or a preponderancy of numbers of that sex above the other in the proportion of about 1 in 47: whence it appears, that in the United States there die 53,630 more of males than of females between the ages of 10 and 26. Therefore, though more males are born and alive at the age 10 in the United States, yet, owing to accidents incidental to the male sex, to maritime, military, and other exposures, and to youthful indiscretion and intemperance, a much larger proportion suffer death before their arrival to the age of 26 than of females.

3. *Notwithstanding the greater mortality among males under the age of* 26, *yet from that age to* 45, *and beyond, there is an increased mortality among females.* The United States contain, of males of 45 years and upwards, 257,311; and of females of the like ages, 244,560; making a majority of the former equal to 12,751. This increased extinction of female life after 26 is probably to be ascribed to pregnancy, child-birth, and diseases peculiar to the softer sex: though in Connecticut, Rhode-Island, Massachusetts and New-Hampshire, owing to the emigration of the men from fulness of population, there is a considerable majority of elderly women.

4. *Of the* 5,166,786 *inhabitants*, 874,777, *or nearly a* SIXTH, *are* SLAVES. Maine, Massachusetts, Vermont, and the Territory North of the Ohio, contain *none* of this class of human beings; New-Hampshire only *eight;* Rhode-Island, Connecticut and Pennsylvania but *a small number*. The great body of these negro and mulatto slaves belong to Maryland, Virginia, the Carolinas, and Kentucky, in which States, taken collectively, they amount to almost *one-third* of the population. In Maryland, by itself, the slaves amount to more than *a third*, and in the eastern district of Virginia to *above half*, the number of inhabitants. In New-York, New-Jersey and Delaware, the number of slaves is by no means inconsiderable. In New-York they make about *one-twenty-seventh* part of the population; and, by virtue of the statute for the gradual abolition of slavery, the denomination will become extinct with the lives or bondage of those who, at the passing of that act, were slaves.

5. *The State of New-York (the total of whose inhabitants is* 586,141*), reckoned alone, the proportions of males and females alone, at different periods of life, are in a somewhat different ratio; there being a larger number of males through all ages.* Here, in this commonwealth, separately considered, the number of males under ten years is 99,995, and of females, is 95,136; making a difference of 4,859 more boys than girls; which is only an excess of 1 in 21, or a production of 20 girls to 21 boys. Of males between 16 and 26 years, this State contains 49,274, and of females between those two ages, 48,216; which is an unexpected difference of 1058, or of *one-forty-sixth* in favour of males. Here the predominancy of males continues through all the hazardous times of life, even to the 26th year. But the ratio alters. Below the age of 10 it was at the rate of 21 boys to 20 girls: after that age to 26, it is in the proportion of 47 boys to 46 girls. In New-York, therefore, there die, between the ages of 10 and 26, as many as 3901 young males more than females. There are several thousand more men alive at the age of 45, and beyond, than of women. The greater immigration of males than females into this commonwealth will explain these variations.

DECOMPOSITION OF WATER BY BOILING OIL.

It has commonly been thought, that when water was thrown into oil heated to the boiling point, it underwent expansion merely, and was converted into steam. And to this sudden

enlargement of liquid water by turning to elastic vapour, have the increased volume boiling over, and violent combustion of oil in such cases, been generally ascribed. It is, however, questionable whether this explanation is correct. Water, dropped into boiling oil, seems to undergo decomposition; its oxygen combining with the oil into a substance approaching to resin, and its phlogiston escaping in the form of inflammable air. This, at least, seems to have happened in the following handsome experiments of Mr. William Mayell, of New-York, communicated to Dr. Mitchill in a letter dated September 1, 1801.

"Recollecting to have heard it said, that if water be thrown upon oil or turpentine when in a state of combustion, it will increase rather than extinguish the flame.—To ascertain the truth of this saying, I tried the following experiment:—I took a part of an oil flask, into which I put some linseed oil, and set the flask upon some red-hot coals, for the purpose of heating the oil. After the oil was heated to a less than boiling heat, I introduced some cold water by means of a small splinter of wood, which I first dipped in water, and then in the hot oil. A violent effervescence ensued. I repeated dipping the wetted splinter in the oil until its surface was covered with froth. I then held the flame of a candle over the oil, and, at the same time, immersed the wetted splinter in it. An explosion took place, but the flame did not attach itself to the oil. This I repeated several times, and each repetition was attended with an explosion.

"That hydrogen gas was the cause of the explosions appeared to me evident; but whether it came from the water or the oil was rather doubtful with me; for, by analysing oil, M. Lavoisier found its constituent parts were hydrogen and carbon; yet it did not appear to me that the oil was decomposed, which must have been the case had the hydrogen gas obtained escaped from the oil. But that the hydrogen gas came from the *water* in consequence of *its* own proper decomposition, appeared very evident to me the next morning, when I found the oil in a congealed state, an effect which follows the combination of oxygen with oil: for, by means of the metallic oxyds which part freely with their oxygen, such as the oxyds of lead, oils are rendered drying, and approach to a resinous state.

"I repeated the experiment a day or two afterwards, which was attended with the same result. I introduced flame to the froth which covered the surface of the oil. A small explo-

sion took place, and the froth or small bubbles instantly disappeared; from which I concluded that the escape of hydrogen gas was the cause of the effervescence. I afterwards used turpentine instead of oil, and observed the same effects to follow; but, upon sprinkling a little water upon it with my fingers, a sparkling took place very similar to that which attends the combustion of gunpowder a little wetted."

BENEFICIAL EFFECTS OF ALKALIES IN CONSUMPTION OF THE LUNGS.

Dr. Lyman Spalding, of Portsmouth, New-Hampshire, has communicated the following case of phthisis pulmonalis, treated by alkalies, to Dr. Barker, of Portland (Maine), in a letter dated August 1, 1801:

"Last April I was desired to visit a woman who had all the symptoms of consumption; such as night-sweats, quick pulse, hectic paroxysms of fever, cough, pain in the side, loss of appetite, furred tongue, and great prostration of strength. Under these circumstances I did not promise much relief. By a plentiful use, however, of soda and lime-water, she now enjoys a tolerable share of health, quite free from hectic symptoms. I believe that *alkalies* are the best remedies yet known for consumptions. They certainly have a most happy effect in those complaints of the lungs. My common dose of soda is a tea-spoonful. In a nauseated stomach I have used this article with general relief, especially if the sickness be accompanied with heart-burn, which is not unfrequently the case."

Dr. Barker has related another remarkable case which occurred in his own practice, in his letter to Dr. Mitchill of August 4, 1801:

"A lady in Portland, aged twenty years, of a tall and slender make, was brought so low in consumption, in the winter of 1801, that she was unable to walk, and could set up only a few hours in the day. Her symptoms were impaired appetite, quick pulse, febrile paroxysms, occasional flushed cheeks, redness of the lips and tongue, sore mouth, pain in the sides, uneasy breathing, cough, and expectoration of matter, which was sometimes tinged with blood; great emaciation of body, night-sweats, &c. She began to complain in February, 1800; and the febrile paroxysms, which were preceded by chilly fits, commenced the following June. In the fall she had taken some foxglove. One quarter of a grain, however, excited vomiting, and induced great pros-

tration of strength, so that it was soon laid aside. After this some elixir of vitriol was taken, which was very offensive to the stomach. Tonic bitters were then substituted, but they evidently excited the fever.

"In this critical juncture, when her lungs were considered as being ulcerated, or otherwise incurably diseased, *alkalies* were recommended by her physicians. These were congenial, and taken with avidity. The consequence was, that her febrile and other complaints gradually abated, and her appetite mended.

"In June she was able to walk, and to ride in a carriage; and in July she took a journey into the country to visit her friends, with few complaints.

"Her confidence in *alkalies* was such, that she had them mixed with almost all her food, and took very little medicine of any other kind while using them, until the fever had subsided, when tonic bitters were conjoined to advantage.

"It appears that, since December last, she has taken, at least, a pound and a half of *sal. absynth*, and a quarter of a pound of *soda*, besides *aqua benedicta* and *creta*.

"Great attention was likewise paid to her nutriment, which consisted chiefly of oily and mucilaginous articles; as milk, and its preparations with Indian meal; jalap, jelly of calves feet, eggs, &c. With such kind of food she was fed in the *night* as well as in the day, agreeably to Dr. Rush's important advice respecting the administration of food in consumption, so that her stomach should not be empty even for a single hour; and her apartment was properly ventilated.

"The recovery of this patient, which was far beyond the expectation of every one who saw her, serves greatly to enhance the reputation of *alkalies* in a disease where we have reason to believe that a POISONOUS ACID is preying upon the delicate fibres, like a canker-worm upon tender foliage."

Dr. Barker has several very similar cases upon record, in which alkalies proved equally efficacious.

PESTILENCE IN THE UNITED STATES.

The summer and autumn of the present year have been generally favourable throughout the United States in respect of the malignant disease popularly called yellow fever. It has indeed made its appearance in several of our cities, and in some unhealthy districts of the country; but no where has it spread so far, or continued so long, as to produce the ravages ex-

perienced in many former years. As on all occasions heretofore, it began under the circumstances which usually generate the annual epidemic disorders of the summer and autumn, prevailing in hot climates, and was suddenly terminated by the coming on of sharp frost. The moderate state of the weather, in the months of July and August, in all probability, was the cause of the later appearance of the disease than common. From the beginning till the 10th of September the heat became violent and steady: about the middle of that month several instances of the disease were observed in this city, and they continued to appear, in greater or smaller number, till the beginning of November.

The cities of New-York, Norfolk (Virginia), and Charleston (South-Carolina), have suffered more, according to our present information, than any other places in the United States. The disease also appeared, and produced some mortality at New-Bedford (Massachusetts), and at Norwich (Connecticut). We likewise heard of prevailing sickness at Savannah (Georgia); but nothing more than common report has yet reached us relative to the latter place. The city of Philadelphia, we learn, has been generally healthful: some cases of malignant fever occurred in the western streets, but did not become so numerous as to excite much alarm.

In the city of New-York the disease commenced, as we before remarked, about the middle of September. About one hundred and forty persons died of it in the city from that period till the last of October; and about thirty persons, chiefly sea-faring men, vagrants, or people otherwise destitute of the means of providing for themselves in case of illness, were sent, within the same period, to the Marine Hospital on Staten-Island, labouring under the disease; of whom a considerable proportion also died. Notwithstanding this small amount of mortality, which did not exceed the rate of ordinary seasons, a great alarm was produced; many citizens left the town, especially those in the most exposed situations, and the course of mercantile business for several weeks was extremely impeded.

The disease chiefly attacked foreigners, or persons from the country; and in the few cases of its attacking natives and residents in the city, it might easily be traced to the effects of some violent exciting cause, such as cold, fatigue, intemperance, &c. It also chiefly invaded persons living in or frequenting certain spots of the town, which were remarkable

for accumulations of filth, for extensive portions of newly made ground, or for the indigence, crowdedness and uncleanliness of the inhabitants.

On looking over a list of the deaths by this disease, and of the residence of the dead, which is laid before the public, it appears that a greater number died in East Rutger's-street than in any other of the city, although the whole number of the inhabitants of that street is comparatively small. The following account of that part of the town will explain this fact:

East Rutger's-street has been settled within a few years; and the houses are built upon a sandy soil, remarkable for the purity and wholesomeness of its water. Accordingly it has been much wondered that such a street should be sickly. Yet the reason is very evident to those who live in the neighbourhood, and know the local circumstances; and some of the neighbours predicted the sickness early in the season. There was in that street, on its east side, and a little to the northward of Lumber-street, an alley or recess, containing seven houses, remarkable for their moral and physical uncleanness. Some time in June the excrementitious matters collected in the houses, tenements and yards situated there, began to be offensive to the neighbours. Some complaints and expostulations were made with the occupants touching their removal. But it was soon discovered that neither the landlords nor the tenants would incur the expense of carrying away the poisonous nuisance of overflowing privies and corrupting offal. During the contention on this point the hot season came on; and, at last, application was made to the street-commissioners to procure the scouring of this alley by public authority. The neighbours, however, do not know that much was done, and more than half remained untouched. Things continued in that foul condition until more than common sickness began to appear among them in the month of September. The alley then had few steady inhabitants; for, in the course of the season, it became the last refuge of the wretched outcasts of some of the worst brothels in the city, and of some of the most needy and depraved European emigrants, who, exhausted with vice and disease, straggled into this pestilential and almost deserted place, remote from the public streets, to terminate their days. A considerable proportion of the deaths which happened there were of these vagrants, a majority of whom were females, turned out of doors by the bawds in whose houses they had formerly dwelt, and for whose infamous service they were no longer

fit. Thus the greater part of the mortality was among people whom none of the resident inhabitants were acquainted with, and who, on inquiry, were found to have been nearly exhausted by intoxication and lewdness before they came there. The scenes of human woe in this alley were diversified with a shocking variety of forms. From this place, as from a local centre, the atmosphere received a poisonous impregnation, and several of the steady and valuable inhabitants were thrown by it into yellow fever, and died with symptoms of great malignity. Yet remarkable it is, that the constitutions of two or three of the original inhabitants became so seasoned to this local atmosphere, that, refusing to quit, they remained there through the whole time, survived, though after several attacks, and are still alive.

The part which next presents the greatest number of victims is Front-street. This fatality was especially remarkable in that portion of Front and Water streets which lies between the Coffee-House-slip and the Fly-Market. It is well known that this part of the city consists entirely of made ground, and that it is underlaid and overspread with all that immense collection of nuisances which length of time and negligence of police could allow to be brought together.

The other parts of the town where the disease chiefly prevailed, when particularly examined, seem to afford full explanation of the local circumstances which led to the greater degree of mortality in them.

Although the comparative smallness of the number of deaths in this season compels us to consider the disease rather as sporadic than epidemic, we are under the necessity of admitting, that, in many cases, as much virulence and malignity appeared in the symptoms and rapid course of it as we ever observed in the epidemic of 1798.

As to the source of this malignant disorder, no reasonable doubt can exist of its domestic production. The incoherent accounts, whispered into the ears of the credulous and undiscerning, but never laid before the public in a specific form, of its originating among two or three sailors from Scotland or Ireland, are too absurd to stand in need of refutation. If it were even admitted that the disease first appeared among persons of that description, still it is incumbent on the importers and contagionists to trace all or most of the subsequent cases to a common centre or centres of human effluvia; a task so utterly hopeless and impossible, that we can venture to assert they will never undertake it. The proofs of non-

contagiousness have been this season so clear and impressive as to satisfy the great body of the citizens of New-York. The sick were scattered over all parts of the town; they were surrounded by physicians, nurses, relatives and friends; every kind and degree of exposure to the effluvia of the patient was continually experienced: yet, notwithstanding all this, no instances of the spreading of the disease by contagion are pretended to have happened. Most of the cases were single ones in the midst of families, many of which were numerous, and all exposed to the virulence of contagion, if any such had at all existed. And to crown the evidence on this point, and prove it to have been an *out-of-doors* poison, unconnected with effluvia from the sick, their clothes or bedding, it disappeared immediately after coming on of sharp frost.

We insert the following account of the yellow fever in New-Bedford, in Massachusetts, from a person living on the spot:

"A vessel arrived in that port from Demarara, some of whose crew had been affected with malignant fever while at Demarara, and one person died on her passage home. Within three or four days after her arrival, some of the persons who had been on board her were taken ill of the fever. Two young men belonging to a neighbouring town were of this number; and both died in three or four days. All who were seized lived near the spot where the vessel lay, which was at the foot of a dirty lane, a place not well ventilated. Eight or nine persons died, but the disease was not communicated, in any instance, from the sick by infection. The vessel contained a large quantity of damaged coffee—injured, it was supposed, to the amount of 85 per cent. of its value—owing to its being not well dried, and stowed on green wood in a close hold. The fever lasted but a few days, and was limited to a small compass near the vessel.

"There is, therefore, good reason to believe the fever to have been engendered by the morbid effluvia from that vessel; but the town of New-Bedford being small, and situated on a dry, rocky acclivity, and containing a good air, the disease did not spread beyond the atmosphere which had been vitiated by the effluvia."

Here is, then, another striking instance of the virus of yellow fever, generated in a vessel, infecting such as went on board or approached within a small distance of it, but, like the poison of carbonic acid gas, not communicable at second hand to persons placed beyond the range of vitiated air.

A few persons have died also at the port of Norwich, in Connecticut, with a disease which is agreed to have been the true yellow fever; but the inhabitants on the spot could trace it to no arrival from abroad.

Concerning Norfolk, in Virginia, we have heard little more than common report. The following certificate of the cessation and non-contagiousness of the yellow fever, under the signature of four of the most eminent physicians in that city, has been published in the newspapers:

"*Norfolk, Oct.* 12, 1801.

"We do certify, that the malignant yellow fever, which prevailed with violence for some time past, has now nearly ceased; and that the health of the town appears to be improving daily. We know of no instances in which the disease has been communicated by contagion.

"SELDEN & WHITEHEAD,
"TAYLOR & HANSFORD."

From Charleston, in South-Carolina, our intelligence is also, as yet, very imperfect. It has been stated that, in the present as in former years, the yellow fever in that city has been chiefly confined to strangers from the higher latitudes and from the country; and that the natives and old residents, in conformity to constant experience in the West-Indies, were seldom affected by that poison.

We hope to obtain, for a future number, a more particular account of the disease, as it appeared at Norfolk and Charleston, from our learned correspondents in those cities.

A Case of Black-vomiting in an Emigrant newly arrived from Scotland, with Remarks on the Diseases of Emigrants. In a Letter from Mr. Quackenbos, of the New-York Hospital, to Dr. Mitchill, dated Sept. 14, 1801.

SIR,

As it has been a subject of much controversy among physicians, whether the American autumnal fever be of domestic origin, or imported from foreign countries, I take the liberty of relating a few facts relative to emigrants from North-Britain, which have lately come to my knowledge, and which I think are worthy of the attention of the learned Professors of Medicine in the Universities of Edinburgh and Glasgow.

September 10.—Admitted into the New-York Hospital, James Tough (a Scotchman), aged 21 years, with all the symptoms of fever. He arrived in this port on the 1st inst. from Leith, in the brig Rambler, Capt. G. Norris; forty-nine days passage. Enjoyed perfect health during the whole of the voyage; and, immediately on his arrival, took lodgings in Front-street, corner of Pine-street, where he remained well till the 9th; when, on his way to the farm of a person in whose service he had engaged himself as gardener, he was seized with pain in the head, back and loins. On the eve of the day following was removed to the Hospital, when, on inquiry, I found that he had taken no medicine, but had vomited a considerable quantity of fluid mixed with bile, a few hours previous to his admission. His pains still continued severe. Pulse 100, and somewhat tense—skin hot and dry—tongue furred—countenance flushed—belly costive.

The attending physician being absent, I prescribed the following medicine to be taken immediately.

℞ Calom. ppt. gr. x.
Pulv. Eccoprot. 3 ss. M.

11*th. Nine o'clock A. M.*—The powder both purged and puked him. His stools were very fœtid, and tinctured with gall. Sumat. qq. hora Spts. Minder. coch. magn. ij.

One o'clock P. M.—Vomits, at the present moment, a dark coloured matter. Omit the Spiritus Mindereri. Let him take one ounce of yeast every half hour.

Nine o'clock P. M.—Vomiting still continues, which very much resembles the grounds of coffee. His intellectual faculties appear somewhat disordered. Pain in the head still very severe. Applicet. statim Empl. Epispast. Nuchæ. Complains also of pain in the stomach.

12*th. Eight o'clock A. M.*—Moribund.

On further inquiry, I was informed that three other men, viz. John Guthrie, Alexander Guylon, and James Cleat, all of whom belonged to the above-mentioned brig, which then lay at a wharf on the east side of the city, were taken sick on the 10th, and were, by order of the Resident Physician, immediately removed to the Marine Hospital on Staten-Island. I was also told that no disease had appeared on board said brig during the whole voyage till her arrival.

At the time of her arrival, the Rambler and her crew were healthy: the city of New-York and its inhabitants, too, were remarkably healthy: and yet here are four decided cases of fever, particularly that of James Tough, without their hav-

ing had any connection, either directly or indirectly, with sick persons here, or with any person or thing of the same kind from the West-Indies, or even Ireland. (See Med. Rep. vol. v. p. 69.)

As these cases have existed, they must have had an origin. Let, then, the strenuous advocates of importation find it out. You will readily discern that a little carelessness, or a little design in telling the story, would make this an instance of importation from Scotland, according to the hypothesis of its being contagious, as plain as the importation of a contagious fever from Boullam to Grenada. But we trust we know better. In these, and similar cases, the exciting cause of the distemper is not in the ship, perhaps not in the city, but in the stomach and intestines of the emigrants, over-charged, as usual after a voyage, with animal food. Here, as in the West-Indies, the food, drink, and way of life which many emigrants indulge, destroy their health and their lives, by exhausting their excitability, and over-charging their living solids with septon; and then the survivors, philosophers as well as the vulgar, most unreasonably throw the blame upon the climate. The alimentary canal is also often disordered by the beef and distilled spirits taken into it, and the rest of the constitution suffers by association of morbid motions and feelings: and indeed it may be thought that a pestilential quality of our atmosphere, too small to affect our natives, could nevertheless operate powerfully upon new-comers and strangers.

Yours with great respect,

NICHOLAS I. QUACKENBOS.

Apothecary of the New-York Hospital.

INTELLIGENCE FROM DR. CHISHOLM SINCE THE PUBLICATION OF THE SECOND EDITION OF HIS WORK ON FEVER.

The celebrated Dr. Chisholm, whose book on the Grenada distemper contains a more full picture of contagion in the West-Indies than any other modern publication, has apparently led some of his readers into a mistake, as respects his own doctrine. He by no means contends that the yellow fever of the West-Indies arises from contagion; but his opinion seems to be, that contagion generated on board the ship Hankey, in 1793, spread by contagion over many of the islands, and much of the continent of North-America, exciting a specific form of disease not known in any of those regions before.

Since the manuscript of this candid and observing physi-

cian's second edition of his work was sent to London to be printed under the eye of Dr. Rollo, a severe sickness broke out in Demarara (August, 1800), where Dr. Chisholm then resided on his rich and productive cotton plantation. The place where it raged was Stabröck, and he describes it as follows:

"A fever of a most alarming nature has most fatally prevailed since the beginning of July. I have visited a few of the sick at the request of Doctors Dunkin and Lloyd in town, and of Dr. Ord on this coast; and I have no hesitation in pronouncing it a fever of infection. Its features are, almost without exception, precisely those of the malignant pestilential fever of Grenada of 1793 and 1794. It is fully as fatal, as rapid, and as insidious. Its origin, as far as it has been ascertained by the gentlemen I have mentioned, seems to be similar. A ship arrived about the beginning of July or end of June from Liverpool, after touching at Surinam. The filth on board, occasioned by a cargo of horses, and the extreme neglect of the officers and crew, was such as beggars description. Infection was the consequence. Her officers and crew were the first sufferers: every man died. All who went on board were attacked, within thirty hours after, with a fever of infection. All who visited the sick, particularly those unassimilated to the climate, have had the same fever. Many white persons, attached to plantations on this coast, whose business led them to town, and to infected houses, received the infection, and had the fever immediately after their return to the country. Of these, as I have already said, scarce one-third, or perhaps one-fourth, have recovered. The cause, I fear, has been neglect in most instances; in many, no doubt, the insidious nature of the disease; and, above all, an unwillingness or fear to make use *instantly* of cold water bathing and calomel, has rendered the fever fatal. A proof of this is the observation of Dr. Dunkin, that those few who became early salivated have been the only survivors. I have endeavoured to impress all the medical gentlemen of my acquaintance with the necessity of the earliest possible use of the two remedies I have mentioned. Pregnancy, under the morbid action of this fever, has uniformly terminated in abortion and death. In some instances whole families (males) have been swept away by it. What a lesson this is to masters of ships! How clearly it exhibits the necessity of exertion on their part to maintain cleanliness on board their ships! And

how evidently does it display their responsibility to the public for the consequences of misconduct!

"I have directed the use of the cold bath in some instances of extreme debility consequent upon fever; and in every one it has proved useful, and in many has saved the patient's life. The effect, however, of the remedy in these instances, and in all similar ones of extreme febrile debility, requires explanation; for, on the received principles, it certainly cannot be accounted for. When the vital powers are prostrate—when the mental faculties are altogether deranged—when, in short, there is no other prospect but approaching dissolution—the sudden affusion of water of 78 deg. gives energy to the former, and collects the latter. But mark the temperature of the patient's body before and after the application of the water, and the state of the pulse. We shall, no doubt, look for an augmentation of animal heat, and an increased celerity of pulse. But the contrary is the fact. I shall mention one instance only. I was not requested to see this patient till the state I have mentioned came on. His powers had been greatly impaired by long residence in the West-Indies, and excessive indulgence in the famous maxim of Ovid—"*Vina parant animos veneri.*" Nature, unaided, sunk under the debilitating influence of infection. Nothing remained but to endeavour to renew her powers; but, alas! it was too late. What cold bathing would have done, however, exhibited at an earlier period, was proved. The following are the results of the many trials made. It was employed every two hours for the last two days of his life.—July 18. Before the application, nearly insensible—heat 100, pulse 100. After—much muscular energy, and perfect mental collection: heat 95, pulse 92.—19th. Before—general state as yesterday: heat 99, pulse 100. After—the same evident effect: heat 92, pulse 96. In this instance four buckets of water were used instead of two.—With two buckets: Before—heat 99, pulse 100. After—heat 95, pulse 100.—20th. About an hour before death—heat 94, pulse 98. After—heat 94, pulse 96. Whilst moribundus, heat at the armpit 98, pulse 120: at the wrist, heat 94: at the foot, heat 88. In articulo mortis, heat at the wrist 90: at præcordia, heat 100—no pulse.—In the case of one of the most respectable merchants in Stabröek, some time ago, when no infection existed (the case being yellow remittent fever, and the state of the patient extreme debility, &c.), at my instance cold affu-

sion was recurred to, with the plentiful exhibition of spiced wine, and mercurials. The event was pleasing: His faculties became perfectly collected; his vital powers improved; and his own sensations, after each affusion, were such as to induce to beg earnestly for a repetition of, and to long for it. He recovered perfectly; and, beyond all doubt, owed his life to these excellent remedies.—I am happy to find your experience, and that of all the well-informed medical practitioners of your acquaintance, tend to confirm the wonderful efficacy of them. I had a letter from Mr. Christie, dated off Surinam, stating his success on board the Hydra with them. —Like most other medical men, I felt rather timid when I began the mercurial practice in the malignant pestilential fever, having no precedent experience to encourage me in it; and, of course, many died under it: but when I became bold in the use of mercury, and gave it freely, my success confirmed the utility of it, and I have never deviated a moment from it since."

The following further extract of this letter to Dr. Davidson, of Martinique, on this subject, exhibits a spirit of composition and accommodation very honourable to the writer, and well worthy the imitation of all the contagionists. We do not mean that they shall declare that hydro-carbonate is an exciting cause of fever, but that they should, like him, allow that there is another exciting cause than contagion. And this, in our judgment, is about the same with giving up the argument.

"There is a circumstance in the fever," so Dr. Chisholm ingenuously writes in his letter dated Demarara, August 10, 1800, "I have given you a general account of, rather singular. The heat has never exceeded 100 deg. as Dr. Dunkin tells me; and the affusion of cold water, of the temperature of 78, has seldom given pleasure; but where it has, the effect has been wonderfully agreeable. In further conversation with Dr. Dunkin, I find that there has been room for conceiving that the fever, in general, was of a mixed nature; that is, that it partook of contagion and miasm—the former giving origin to it, and the latter, in the greater number of cases, giving it the remittent form, and diminishing the tendency of contagion to emanate and assimilate. I know it is almost an axiom in medicine, that two causes cannot act at the same time on the human system, so as to produce a disease partaking of the nature of each: but I suspect it has been adopted without sufficient investigation; for why may not

hybridous diseases exist as well as hybridous animals and plants? Sure I am, the accounts of many medical writers cannot be reconciled without the admission of such. In the present instance, Mitchill's gaseous oxyd of azote (septic acid vapour), proceeding from the decomposition of animal matter, particularly the urine of horses (and the excretions of men, he might have added), produced, at first, a disease of a pure pestilential nature. It afterwards formed a combination with the hydro-carbonate of the trenches, and the combination gave existence to a disease of a malignant remittent nature. From this arise, probably, the low temperature of the body—the consequent dislike to the application of cold—the excessive debility which constantly followed depletion, particularly bleeding at any period of the disease, and however constituted the patient might be. This disease has afforded an additional proof of the inefficacy of bark, and of the injury which may follow the exhibition of it. In no case was it useful, and in every one it excited or augmented gastric irritation. Taking a view of all the circumstances, we clearly see the necessity for the adoption of what may be called qualified antiphlogistics, the action of which will render that of all others unnecessary; for, remove the proximate cause, which is an inflammatory diathesis of a peculiar nature, and you remove the disease."

On comparing the tenor of this letter with what appears in Dr. Chisholm's published writings, we are happy to find much less variance between his opinions concerning malignant diseases and our own, than we formerly supposed to exist. The Doctor strenuously maintains, in his "Essay on the Malignant Pestilential Fever which prevailed at Grenada in 1793 and 1794," that the yellow fever of the West-Indies is an *endemic disease, arising from the miasmata of putrefaction, and not contagious.* In the case of the supposed introduction of the malignant pestilential fever, by the ship Hankey, into the island of Grenada in 1793, he believed the fever, so introduced, to have been *generated on board of the ship*, and not to have been derived from Boullam, or any other part of Africa. In this account, likewise, of the supposed importation of a malignant disease into Demarara, he evidently holds forth the opinion of its originating in the ship, *from the decomposition of animal matter, particularly the urine of horses.* Nothing is said or hinted of the infection having been received at Surinam, where the ship touched on her voyage; and few, we suppose, would undertake to trace it to Liver-

pool, or any other part of Great-Britain. We are glad to observe that Dr. Chisholm is not so unreasonable as to believe that the yellow fever of the West-Indies may be caught like the small-pox, by seamen navigating vessels to these islands, and, through the medium of their persons, clothing, or bedding, be transported to the continent of America. His good sense and experience had taught him, that the opinion of the inhabitants of the West-Indies, that yellow fever is one of the native products of their islands, destitute of contagion, and consequently incapable of exportation or importation, is strictly true. It gives us pleasure and confidence to find such an auxiliary as Dr. Chisholm in the support of this important fact.

But in two points we dissent from Dr. Chisholm: 1st. In his opinion of the *peculiar nature* of the pestilential disease which appeared in Grenada and Demarara, and of its differing essentially from the yellow fever as it prevails in the West-Indies, and on the American continent. And, 2dly. In his opinion of the contagiousness of the pestilential disease generated on board of ships, while he justly acknowledges that the yellow fever is not capable of being propagated by such means.

It would be unnecessary here to reiterate the arguments so often employed to prove that a malignant fever, generated on board of a filthy or crowded vessel, is precisely similar to such a disease generated on land where filth is accumulated, or a number of inhabitants crowded into small, uncleansed and unventilated houses. If the latter circumstances of crowded dwellings, without cleanliness or ventilation, take place in a cool climate, or in a cool season of the year, the generation of typhus may be expected to be the consequence, as is continually happening in Great-Britain, and in other countries similarly circumstanced; whereas, if great accumulations of filth be suffered to be formed in ships, houses, or in towns, and, at the same time, be acted upon by high atmospheric heat, yellow fever may justly be dreaded as the consequence, agreeably to the experience of the West-Indies, and of many parts of the American continent, especially in those seasons, or in those situations, where morbid constitutions of the atmosphere are, by their effects, known to prevail.

As to the contagiousness of this ship, house, city or marsh fever, we have recently, as well as formerly, had so much pointed and repeated experience in this country, and so often laid the results of this experience before our readers, that we shall not,

at present, fatigue them with a reiteration of the facts. Ships, in which the poison of putrefaction had been generated to the most virulent degree, have, indeed, often entered our ports and harbours in the United States, and destroyed the lives of multitudes of our citizens, who went on board, or too nearly approached them. But after listening to much vague report and much positive assertion, always discovered to have been misrepresented when duly traced, we have never met with a single authentic instance of the spreading of such diseases by contagion. And as to the mixed or hybrid forms of malignant fever, concerning which Dr. Chisholm offers his conjectures, we can only observe that they appear to us to be founded upon an analogy too remote and fanciful to serve as the basis of sound or correct reasoning.

ANOTHER INSTANCE OF PESTILENCE ENGENDERED IN A SHIP CROWDED WITH PASSENGERS FROM IRELAND.

The ship Nancy, Capt. John Herron, was chartered by a commercial house at Sligo, to carry passengers from that port to New-York. She sailed from Sligo on the 12th July, 1801, and arrived, after a passage of 77 days, at the port of New-York, on the 27th of September following. This ship, of the burthen of 202 tons, received on board 417 passengers, and was navigated by nine seamen. The provisions, mere refuse, put up by government-contractors with the view of saving expense, were of the worst kind; and the water, which was also of bad quality, from the unexpected length of the voyage, became extremely scanty before the arrival of the ship.

In order to receive so great a number of passengers on board of this ship, temporary cabbins were built on the quarter-deck, which were filled with eighty persons. Three hundred were crowded into the space between decks.

It will excite no surprise that a vessel thus crowded became sickly soon after sailing from Sligo. Typhous fever and dysentery soon began to prevail, and destroyed the lives of a large proportion of the passengers.

In addition to the wretchedness of being confined in such numbers in so small a space, these unhappy emigrants suffered all the evils which their habits of uncleanliness could produce. Their bodies and clothes, covered and saturated with filth, exhaled poison all around them. Partly from the want of strength and assistance among the sick, and partly from the want of a sense of decency, the space between decks, occupied by nearly 300 persons, became the receptacle of all

excremental matters, insomuch that they issued in streams from the scuppers The filth on the upper deck was nearly over the shoes. The sides of the ship were daubed and incrusted with excrements; and even the ropes for the support of such as wished to go on board were unfit to be handled. The stench was intolerably offensive.

In such condition arrived this unfortunate vessel at the place assigned for quarantine in the port of New-York. Ninety persons had died on the passage; one hundred and eighty were sick. Scarcely a healthy countenance was to be seen on board of the ship; very few had escaped disease; and many had suffered from three to four relapses. About forty were taken ill after their arrival.

As soon as possible after their arrival the sick were brought ashore; stripped of their filthy and pestilential clothes; their bodies thoroughly washed and scoured with soap and water; and then wrapped up in clean blankets, and carried into the wards appointed for their reception in the Marine Hospital. The permanent buildings of the establishment were insufficient to receive so great a number; tents, and other temporary accommodations, were provided for the remainder. Separation, ventilation and cleanliness, as soon as they could be brought into action, accomplished every thing that could be expected. And only twenty-six have died since their arrival at this port.

PROGRESS OF THE COW-POX IN AMERICA AND EUROPE.

The Rev. Mr. DUBY, in a letter to Dr. Mitchill, dated Geneva, in Switzerland, June 12, 1801, mentions that the vaccine disease had been quite established there for above a year. And from Citizen COLON's *Histoire de l'Introduction et des Progres de la Vaccine en France,* Paris, 1801, which lately reached us, we learn that it has made great progress in France, notwithstanding the firm opposition it met with, and is proved "to be attended with the same advantages as the inoculated small-pox, but without its disadvantages." (p. 260). On the subject of the disease, Professor Waterhouse has written thus to Dr. Mitchill, in a letter dated Cambridge, Sept. 26, 1801.

"President Jefferson informs me that the kine-pox has pervaded, or is pervading, his family at Monticello, more than twenty having already gone through the *genuine* disease—at least I presume so from the virus sent him, and the description he has given me of its effects. It is progressing in this quarter with

undeviating success, *very few* spurious cases having occurred this season.

" Yesterday I received a letter from Dr. Jenner, one paragraph of which I must transcribe, because it contains the *golden rule of vaccination*, viz.

' I dont care what British laws the Americans discard, so that they stick to this—*Never to take the virus from a vaccine pustule, for the purpose of inoculation after the efflorescence is formed around it.* I wish this efflorescence to be considered as a sacred boundary over which the lancet should never pass.'

" Dr. Jenner sent me also a few pages of a work not yet published. In it he says the distrust and scepticism which naturally arose in the minds of medical men, on my first announcing so unexpected a discovery, has now nearly disappeared. ' An *hundred thousand* persons, upon the smallest computation, have been inoculated in these realms. The numbers who have partaken of its benefits throughout Europe and other parts of the globe are incalculable; and it now becomes too manifest to admit of controversy, that the annihilation of the small-pox, the most dreadful scourge of the human species, must be the final result of this practice."

A REPORT ON THE VACCINE OR KINE-POX INOCULATION IN NEW-YORK: COMMUNICATED BY VALENTINE SEAMAN, M. D.

" With infection fresh from the arm of Governor Sergeant's domestic, who had been inoculated in Boston by Dr. Waterhouse, and who arrived here on 22d of 5th month (May), in due season for his pustule to contain active matter, I succeeded in vaccinating a number of persons, in this city. The complaint (altogether different from that festering scab induced by the spurious matter received in the winter) commencing with a slightly inflamed spot, gradually increased to a circular pustule, elevated at its edges and depressed in the centre, containing a transparent watery fluid, slowly oozing out at punctures made into it, and finally terminating in a hard dark-coloured scab; all, *through the various stages*, so exactly corresponding with the accurate descriptions and delineations given by the most attentive writers—left no doubt on my mind of its being the *genuine* vaccine disease.

" To crown the experiment, however, not only for my own satisfaction, but also for the satisfaction of those more per-

sonally concerned, I afterwards inoculated several of them for the small-pox: viz. Capt. J. O'Brian's babe, boy and black girl, on the 23d of the last month, fifteen days after they had had the kine-pox inserted, were inoculated, by a double incision, with the most active small-pox matter, fresh taken from a person then labouring under that disease in the natural way; neither of whom was any way affected thereby, further than having a slight irritation upon the part, which disappeared in the course of six or seven days. After ten days they were all inoculated over again with active small-pox matter, with a like result. A fourth one, upon whom the *proving* experiment has been made, is a servant-woman of Jacob Wood, in Pearl-street. She was inoculated, on the 7th of this month, with active virus still fluid from the pustule of a person who had a great load of the small-pox: this was the sixteenth day after her vaccine inoculation. She has not since, and now it is twenty-three days, felt any effect but a little tumid redness upon the part, which disappeared in less than a week. Her son, of about seven years of age, who had been inoculated for the kine-pox fourteen days before, was also inoculated for the small-pox on the 11th of the present month, but to no effect.—I have, in all, inoculated eighteen with the infection derived from the source abovementioned.

" This disease (if a disease it may be called), as far as has come within my observation, has been of an extremely mild nature. In not a single instance, in children, has there appeared to be the least general indisposition induced, nor in grown persons has there been so much as in the least to interrupt them in their usual occupations. Not one has had any eruption whatever excepting at the incision.

" When we consider how generally a spurious matter has been disseminated, and that we ourselves were most unluckily imposed upon with it, and by what a peculiar concurrence of circumstances the genuine infection was finally obtained, we cannot, I think, let it die with indifference, particularly before it shall undergo a more thorough trial. Whether infection be lost or not, this one consolation remains with me, that I have at least done justice to my own child, by having implanted it in him; and I feel a full compensation for all my trouble in this business, in the well-grounded belief of having thereby secured him from the influence of a disease which, even in the present improved manner of communicating it, is always dreaded—not unfrequently extremely

painful and distressing—sometimes ruinous to the constitution —and, at other times, more immediately fatal."

RUSH'S INTRODUCTORY LECTURES.

Messrs. John Conrad & Co. of Philadelphia, have just published, "Six Introductory Lectures to Courses of Lectures upon the Institutes and Practice of Medicine, delivered in the University of Pennsylvania, by Benjamin Rush, M. D. Professor of Medicine in the said University."

NEW MEDICAL WORK.

Messrs. Conrad & Co. have also in the press a new and original work on the following subjects: I. A specimen of physical geography, comprehending an investigation of the physical causes of heat and cold in various countries, and their alternate effects on the human body, from change of climate or seasons of the year. II. Sketches of medical topography, the causes of various local impregnations of the atmosphere from marsh miasmata, infectious effluvia, &c. III. The experimental philosophy of human life, of diseases, and remedies, applied to the healing art. IV. An analysis of modern medical surgery. V. The physical causes, the nature and treatment of the diseases most prevalent in warm climates and autumnal seasons. 1. Bilious affections and diseases of the liver, as obstructions and inflammations, and their consequences—abscess, scirrhus, dropsy and hypochondria. 2. Diseases of the first passages, as choleras, diarrhœas and dysenteries—their natures and remedies, &c. 3. Fevers, such as intermittents and remittents, and their varieties; and continued fevers, as the typhus, or low nervous fever, and the pestilential or yellow fever.—By William Barnwell, M. D. formerly surgeon in the employ of the Hon. East-India Company of London, and now of Philadelphia.

In order to render the work more generally useful to gentlemen going to warm climates, or those who reside in the country, terms of art have been studiously avoided or explained.

The work will be printed on fine wove paper, and a good pica type. It is expected to consist of about four or five hundred pages, at two dollars in boards, or two and a half bound, to be paid on delivery of the book. The work is now in the press, and expected to be finished about the middle of December.

NEW MEDICAL AND SURGICAL SCHOOL.

We are pleased to hear that overtures are now on foot, and with a fair prospect of success, for converting the public Almshouse of the city of Philadelphia into a school for *medical* and *surgical* instruction. The number and variety of interesting cases which this institution constantly affords, gives it as great advantages in these points of view, as any other place in the United States. The conducting of the principal part of the medical and surgical business is likely to devolve on Dr. Physic and Dr. Caldwell.

FOREIGN.

ORIGIN OF THE VACCINE INOCULATION.

THE most important discoveries, when familiarized to the mind, are contemplated with indifference. Who now wonders at the discovery of America, or the circulation of the blood? There is, however, a period between the conception of a discovery and its mature birth, fraught with more pangs than war or women know; and there is no light in which the human mind can be viewed more interesting than during this anxious period. Whenever, therefore, the author of any greatly useful invention details the progress of his own mind during the completion of his plan, the history is perused with avidity. On these grounds we conclude that our readers will be much gratified by the following narrative:

"*I am induced to give the following concise history of the origin of vaccine inoculation, from my frequently observing that those who only consider the subject cursorily, confound the casual cow-pox with the disease when excited by inoculation.* EDWARD JENNER.

"My inquiry into the nature of the cow-pox commenced upwards of twenty-five years ago. My attention to this singular disease was first excited by observing that, among those whom, in the country, I was frequently called upon to inoculate, many resisted every effort to give them the small-pox. These patients, I found, had undergone a disease they called the cow-pox, contracted by milking cows affected with a pe-

culiar eruption on their teats. On inquiry, it appeared that it had been known among the dairies time immemorial, and that a vague opinion prevailed that it was a preventive of the small-pox. This opinion I found was, comparatively, new among them; for all the older farmers declared they had no such idea in their early days—a circumstance that seemed easily to be accounted for, from my knowing that the common people were very rarely inoculated for the small-pox, till that practice was rendered general by the improved method introduced by the Suttons; so that the working people in the dairies were seldom put to the test of the preventive powers of the cow-pox.

" In the course of the investigation of this subject, which, like all others of a complex and intricate nature, presented many difficulties, I found that some of those *who seemed to have undergone the cow-pox*, nevertheless, on inoculation with the small-pox, felt its influence just the same as if no disease had been communicated to them from the cow. This occurrence led me to inquire among the medical practitioners in the country around me, who all agreed in this sentiment, that the cow-pox was not to be relied upon as a certain preventive of the small-pox. This for a while damped, but did not extinguish my ardour; for, as I proceeded, I had the satisfaction to learn that the cow was subject to some varieties of spontaneous eruptions upon her teats; that they were all capable of communicating sores to the hands of the milkers; and that whatever sore was derived from the animal, was called in the dairy the cow-pox. Thus I surmounted a great obstacle, and, in consequence, was led to form a distinction between these diseases, one of which only I have denominated the *true*, the others the *spurious* cow-pox, as they possess no specific power over the constitution. This impediment to my progress was not long removed, before another, of far greater magnitude in its appearance, started up. There were not wanting instances to prove, that when the true cow-pox broke out among the cattle at a dairy, a person who had milked an infected animal, and had thereby apparently gone through the disease in common with others, was liable to receive the small-pox afterwards. This, like the former obstacle, gave a painful check to my fond and aspiring hopes: but, reflecting that the operations of nature are generally uniform, and that it was not probable the human constitution (having undergone the cow-pox) should in some instances be perfectly shielded from the small-pox, and in many others re-

main unprotected, I resumed my labours with redoubled ardour. The result was fortunate; for I now discovered that the virus of cow-pox was liable to undergo progressive changes, from the same causes precisely as that of small-pox; and that, when it was applied to the human skin in its degenerated state, it would produce the ulcerative effects in as great a degree as when it was not decomposed, and sometimes far greater; but having lost *its specific properties*, it was incapable of producing that change upon the human frame which is requisite to render it unsusceptible of the variolous contagion: so that it became evident a person might milk a cow one day, and having caught the disease, be for ever secure; while another person, milking the same cow the next day, might feel the influence of the virus in such a way as to produce a sore or sores, and, in consequence of this, might experience an indisposition to a considerable extent; yet, as has been observed, the specific quality being lost, the constitution would receive no peculiar impression.

"Here the close analogy between the virus of small-pox and of cow-pox becomes remarkably conspicuous; since the former, when taken from a recent pustule, and immediately used, gives the perfect small-pox to the person on whom it is inoculated; but, when taken in a far advanced stage of the disease, or when (although taken early), previously to its insertion, it be exposed to such agents as, according to the established laws of nature, cause its decomposition, it can no longer be relied on as effectual. This observation will fully explain the source of those errors which have been committed by many inoculators of the cow-pox. Conceiving the whole process to be so extremely simple as not to admit of a mistake, they have been heedless about the state of the vaccine virus; and finding it limpid, as part of it will be, even in an advanced stage of the pustule, when the greater portion has been converted into a scab, they have felt an improper confidence, and sometimes mistaken a spurious pustule, which the vaccine fluid in this state is capable of exciting, for that which possesses the perfect character.

"During the investigation of the casual cow-pox, I was struck with the idea that it might be practicable to propagate the disease by inoculation, after the manner of the small-pox, first from the cow, and, finally, from one human being to another. I anxiously waited some time for an opportunity of putting this theory to the test. At length the period arrived. The first experiment was made upon a lad of the

name of Phipps, in whose arm a little vaccine virus was inserted, taken from the hand of a young woman who had been accidentally infected by a cow. Notwithstanding the resemblance which the pustule, thus excited on the boy's arm, bore to variolous inoculation, yet, as the indisposition attending it was barely perceptible, I could scarcely persuade myself the patient was secure from the small-pox. However, on his being inoculated some months afterwards, it proved that he was secure. This case inspired me with confidence; and as soon as I could again furnish myself with virus from the cow, I made an arrangement for a series of inoculations. A number of children were inoculated in succession, one from the other; and, after several months had elapsed, they were exposed to the infection of the small-pox—some by inoculation, others by variolous effluvia, and some in both ways; but they all resisted it. The result of these trials gradually led me into a wider field of experiment, which I went over not only with great attention, but with painful solicitude. This became universally known through a treatise published in June, 1798. The result of my further experience was also brought forward in subsequent publications in the two succeeding years, 1799 and 1800. The distrust and scepticism which naturally arose in the minds of medical men, on my first announcing so unexpected a discovery, has now nearly disappeared. Many hundreds of them, from actual experience, have given their attestations that the inoculated cow-pox proves a perfect security against the small-pox; and I shall probably be within compass if I say thousands are ready to follow their example; for the scope that this inoculation has now taken is immense. An hundred thousand persons, upon the smallest computation, have been inoculated in these realms. The numbers who have partaken of its benefits throughout Europe, and other parts of the globe, are incalculable; and it now becomes too manifest to admit of controversy, that the annihilation of the small-pox, the most dreadful scourge of the human species, must be the final result of this practice."

[*Med. and Phys. Journal.*

NEW REMEDY FOR THE STONE.

A surgeon of Madrid has been able to dissolve camphor in water by means of the carbonic acid. This camphorated solution, injected into the urethra of persons afflicted with the stone, allays the pain almost instantaneously.

[*Philos. Mag. for Dec.* 1800, p. 291.

APPENDIX.

ARTILCE I.

THOUGHTS *on* QUARANTINES *and* LAZARETTOS: *Addressed to* RICHARD BAYLEY, *Esq. Health-Officer of the Port of New-York, by Dr.* MITCHILL, *in a Letter dated July* 7, 1801.

REGULATIONS for preserving the health of men against foreign contagions make so considerable a part of the code of several European nations, that it is very interesting to know in what state of society, and under what circumstances, they arose, that we may thereby the better judge of their value and usefulness. It will appear, on investigation, that they were originally adopted before the principles of science on which they depend had been unfolded, and in times of fanaticism and terror, when the human mind was not in a condition to judge calmly about them, if they had been unfolded.

These regulations refer to three great objects: 1. Quarantines: 2. Lazarettoes: and, 3. Areas and stores for unladed goods and merchandize. On examining the history and actual condition of each of these, it will be found that in most cases they are instrumental in engendering and perpetuating that pestilence which it is their professed object to avoid. They all take it for granted that malignant and pestilential diseases are contagious—a supposition utterly groundless; and then undertake, with vast parade, to prevent the importation of this imaginary contagion. But a concise review of their history will set these establishments in the clearest light.

A quarantine, from "quarante," the French word for "forty," in its simple sense, means a duration of "forty" days. As a term of the common law, it means the time a widow is permitted to remain in the mansion-house of her deceased husband, and this is called her "quarantine." This was a reasonable regulation, that the widow might not be turned out of doors immediately by the heir; but, after funeral rites were performed, might be allowed time to make deliberate arrangements for removal, and to receive an assignment of dower.

But what could have been the reason of fixing upon "forty" days for the detention of ships suspected to be already too dirty to live in, and, consequently, to be admitted into port? The direction of plain sound judgment, in such cases, would be to hoist out the cargo as fast as possible at some convenient station, rather remote from thick population, and to remove the nuisances, corruption and poison engendered on board with all speed. The mode of removing these, and of cleaning and sweetening a room so as to make it habitable and healthy, is so perfectly and practically understood, that scarcely a washer-woman or a chambermaid is ignorant that *lime*, *alkaline leys* and *soaps*, will destroy every particle of infection there. And as the pestilential poison could be thus destroyed in a *habitation on shore*, there can be no possible reason to doubt their efficacy in destroying it on board a ship, which is but a *human habitation afloat*. But it has been the misfortune of American and English navigators to adopt a mode of cleansing ships different from the method of cleaning houses; and great sickness and mortality have been the consequence.

Christendom is beyond a doubt the most intelligent portion of the globe. How, then, came the Christians, I say, to fix upon "forty" days as the expiatory period? It proceeded, probably, from a religious or superstitious veneration for the number "forty:" for "forty" is a very remarkable number, as well as "three," "seven," and "twelve." In the days of Noah the rain was upon the earth *forty* days and *forty* nights (Gen. vii. 12). Moses remained on Mount Sinai *forty* days and *forty* nights (Deut. x. 10). If a wicked man was to be beaten, the number of stripes to be given, by order of the judge, was not to exceed *forty* (Deut. xxv. 3). The men sent by Moses to search the land of Canaan were engaged in that employment *forty* days (Numb. xiii. 25). And the Jews who murmured on hearing the report of the spies, were denounced to wander in the wilderness, and bear their iniquities (a year for a day) *forty* years (Numb. xiv. 33, 34). Christ fasted *forty* days and *forty* nights in the wilderness (Mat. iv. 2). And was seen by the apostles *forty* days after his resurrection (Acts i. 3). And, in the Christian Church, the season of Lent, or penitentiary abstinence between Shrove Tuesday and Easter, was continued for *forty* days.

Thus we find a term of *forty* days had been frequently noticed in sacred history. Even an opinion of sanctity had been attached to it both among Jews and Christians. It was

associated with various events and usages of their religions, and had been employed as an expiatory and penitential period for uncleanness and sin.

The expeditions of the Franks, or Christians of the west, who, in the spirit of crusading, poured into Palestine to rescue it from the Mahometans, gave rise to quarantines for ships and sea-vessels. The readers of these expeditions well know what misery, want, uncleanness and mortality accompanied them as they marched or sailed. There was an incredible destruction of the human species by diseases, independent of the numbers who fell by way-faring accidents, or perished by the sword of the enemy.

After severe and costly exertions, the faithful accomplished their purposes, and established the kingdom of Jerusalem. But they held it uneasily, and they held it not long: for, forced at length to abandon their dear-bought conquest, the infidels once more took possession of the Holy Land. During the wars which had been waged between the Christians and Mahometans for the possession of Judea, the religious animosity of the two parties had been carried to the utmost violence of opposition and hatred, by every species of private as well as public aggravation. And the Franks, as they reluctantly quitted the country of the patriarchs and apostles, charged the Turks with all their disasters, and accused them as the authors of almost every evil which they suffered. Among other miseries, and that not the least in the enumeration, the returning Europeans affirmed that the Asiatics had infected them with the PLAGUE.

They forgot that the desolation of their armies by this disease had been so great that their line of march from their places of rendezvous could be traced through Hungary, and along the route to Constantinople, by the bones of the unburied dead. On this the Orientals might have affirmed that these invaders had imported the plague from Europe. Perhaps they did; but because similar sickness attended the Franks on their return from the Levant, produced by their customary uncleanness, bad management, exposure to hardships and want of necessaries, they roundly asserted the distemper was contagious, and the contagion catched from the infidels. To countenance this notion, they affirmed the Turks were fatalists; and, as they took no pains to destroy or avoid the contagion of this horrible disease, it was always alive and active among them. They persuaded themselves this contagion, if introduced, would spread like fire, and consume as

a conflagration. A prudent government, therefore, should guard against it by every precaution.

An interdiction of all intercourse with the infected cities of the Archipelago and the Levant promised the most perfect security from the contagion. But the policy and commerce of nations forbade so strict a prohibition. It was therefore agreed that travelling and trade might be carried on, provided voyagers, merchants, and every thing they carried with them, were subjected to certain salutary restraints; and one of these restrains was a QUARANTINE, or detention of *forty days* and *nights*, to conquer the pestilential contagion, or to let it die for want of something to feed upon. Latterly "quarantines" have been shortened to *fourteen*, *eight*, or even *three* days, according to circumstances.

Thus a dirty or sickly vessel, in a hot climate, with corrupting and perishable things on board, became more foul and intolerable from inbred mischief working within her during her quarantine in one of the Mediterranean harbours, than she had been during her voyage; and, by the most preposterous interpretation, all this local and domestic infection, hatched and reared by bad management in ships, and increased under quarantine regulations among the Christians, is ascribed to a *plaguy* contagion imported from Turkey, Syria or Egypt! And so, because quarantines were established in days of ignorance, prejudice, rancour and intolerance, between the Franks and the Turks, they have been adopted as matters of course by the Christian nations in their intercourse with each other: in consequence of which the ships of New-York are compelled to perform a quarantine at Cuxhaven, those of Baltimore at Cadiz, and those of Naples at Philadelphia, for fear of mutually importing yellow fever and plague. Surely these things are worthy of being better understood.

Quarantines, you see, thus arose from a desire of stopping a supposed contagion, catched, as was erroneously believed, from the Asiatics, and were tinctured with superstitious notions or ideas of religion badly interpreted. During the *forty* days detention of a ship and cargo, the persons who were actually sick, or suspected to have contagion lurking about them, were removed to an hospital, to remain until the period of danger was supposed to be past. This hospital was called by one of the most odious and disgusting names that could be thought of. It was derived from LAZARUS, the decrepit beggar, who lay covered with sores, and starving at the rich man's gate. The *Lazar-house*, or *Lazaretto*, was the place of re-

ception for those who were suffering from pestilential nastiness and venom, and for those that were supposed to be in immediate danger of sickening by it, or of rendering others sick. Being constructed frequently of very durable materials, these Lazarettos were the receptacles of all the newly-arrived persons who were thought proper subjects of detention, for a great number of years in succession. Hence they became remarkably foul and pestilential. The chambers were often much neglected, and abounded in uncleanness and corruption. From an accumulation of all manner of impurity from year to year, those hospitals themselves became the *nurseries of the plague;* not arising from contagion here any more than on ship-board, but proceeding from animal excretions, corrupting provisions, and the like, undergoing putrefaction in a hot climate. The plague, engendered and perpetuated in these direful hospitals too, was most uncharitably ascribed to the Turks!

The local and domestic origin of pestilential distempers, and of alkalies to quell their exciting cause, is strikingly proved in the benevolent HOWARD's account of his quarantine at Venice, contained in his book on Lazarettos, p. 11. And if he had written nothing but this, he would have deserved the approbation of all classes of men. "Soon after unloading the boat," he writes, "the sub-prior came, and showed me my lodging in the NEW Lazaretto, *which was a very dirty room, full of vermin, and without a table, chair or bed.* That day and the next morning I employed a person to wash my room; *but this did not remove the offensiveness of it, or prevent that constant head-ache which I had been used to feel in visiting other Lazarettos, and some of the hospitals in Turkey.* This Lazaretto is chiefly assigned to Turks and soldiers, and the crews of those ships which have the plague on board. In one of the inclosures was the crew of a Ragusan ship which had arrived a few days before me, after having been driven from Ancona and Trieste. My guard sent report of my health to the office; and, on the representation of our consul, I was conducted to the OLD Lazaretto, which is nearer the city. Having brought a letter to the prior from the Venetian ambassador at Constantinople, I hoped now to have had a comfortable lodging: but I was not so happy. The apartment appointed me (consisting of an upper and lower room) was no less disagreeable and offensive than the former. I preferred lying in the lower room, on a brick floor, where I was almost surrounded with water. After six days, however, the prior removed me to an apartment in some respects better, and

consisting of four rooms. Here I had a pleasant view; but *the rooms were without furniture, very dirty and no less offensive than the sick wards of the worst hospital. The walls of my chamber, not having been cleaned probably for half a century, were saturated with infection.* I got them washed repeatedly with boiling water, to remove the offensive smell, without any effect. *My appetite failed, and I concluded I was in danger of the slow hospital fever,*" &c. Strong prejudices were opposed to his having the room *white-washed with lime.* He, however, with great difficulty, got it done at last; and the consequence was, the noxious vapours were neutralized, and it was immediately rendered so fresh and sweet, that he was able to drink tea in it in the afternoon, and to sleep in it the following night. The other inhabitants of the Lazaretto admired these strange proceedings. Mr. Howard observes, that he left his successors an agreeable and wholesome room, instead of a nasty and contagious one.

This contamination of the walls of buildings seems to be less regarded now than formerly. In the times of the ancient Jews, the plague of leprosy, which invaded them, invaded their houses as well as their persons. This nasty distemper required a very particular method of treatment (ablution by water and anointing with oil), that the person infected by it might be rendered clean. The direction given was, that the person discovering this plague to be in the house should inform the priest of it, who should order the house to be emptied, and then proceed to examine the condition of it. The poison, acting as the exciting cause of the disease, possessed qualities enabling it to attack and corrode the materials of the walls, "forming hollow streaks, greenish or reddish, which in sight are lower than the wall."

Being curious to know the composition of this mortar, for the habitations of the wealthy, I sought carefully for information; and I am led to believe the cement or mortar now in use was the same which the ancient inhabitants of Syria, Judea and Egypt were wont to employ; that is, a composition of *two* parts of wood-ashes, *three* of lime, and *one* of fine sand, sifted, mixed and beaten intimately together, and softened with oil and water until they became of a proper consistence. One can easily comprehend how such a wall, after resisting and neutralizing a long time, could be corroded and discoloured at last by *septic acid gas.*

When the noxious matter or vapour thus showed itself in the house, and was spreading through it, the command in Le-

viticus is, to take away the very stones that are infected, and carry them to an unclean place without the city—to scrape the house within round about, and carry away the dust which is scraped off—and to repair the house with other stones and other mortar, and plaster it anew. And if, after these things were done, the plague shall come again, and break out in the house, it is directed to be demolished, and the stones, timber and mortar of it to be carried out of the city. A private family here was forbidden to live in an unclean house. Great pains were taken to purify it, and if it was found too dirty to be cleaned, it was to be pulled down as untenantable. How different is the practice of modern times! A ship that has lost a succession of crews by inbred fevers is considered sea-worthy as long as her timbers and planks will hold together, without regarding the unhealthiness of her condition, nor whether she is too unclean to accommodate a family of human inhabitants. A Lazaretto, the slaughter-house of hundreds, whose floors and walls have imbibed putridity and infection ever since they were erected, is considered a proper receptacle for the wretches who have the plague, or are suspected of falling sick with it. A private dwelling in a city has been inhabited by unclean and indigent inhabitants for several hundred years; and in America some of these die of yellow fever, in Great-Britain of typhus, and in Turkey of plague. The exciting cause of these distempers being one and the same, only differently modified, invests them closely, and sallies forth from its lurking places in every part of their habitation. Yet this house is tenantable, and some new inhabitant to-day takes the place of the victim of yesterday. In these examples, the ship, the Lazaretto, and the house, are the places where pestilence is engendered. Local origin, in every instance, as in the leprous-house of the Jews, bears sway, and ought to be guarded against by removing contaminated materials, by scraping and fresh plastering according to the Levitical regulations, or by actual demolition.

There is one subject of inquiry which the Europeans who have travelled to Asia have generally omitted. This is the domestic economy of the inhabitants. To a person who reflected on the frequent occurrence and destructive violence of pestilential distempers in some of the ports near the eastern shores of the Mediterranean Sea, it would appear certain that there must be bad management, either within the houses and their appurtenances, or in the cities and their purlieus, or in both. That there is a kind of human nastiness, whence

unhealthy and fever-producing exhalations proceed, is sufficiently well known. And if the Mahometan way of building houses, and living in them, throughout Syria and Egypt, tends to promote the accumulation of this foul and noxious matter, then a proportional degree and extent of sickness and mortality may be expected. But in vain do we search the books of the principal part of the physicians, philosophers, and mercantile, and merely curious travellers, for this kind of information. It has been deemed, probably, too vulgar and unimportant for a polite and entertaining writer to treat of. Yet I am bold to express my conviction, that the origin and cause of their endemic fever or plague can never be understood without it. And it is for want of this knowledge that the greater number of those writers who have treated of this disease, have done it with so much prejudice and with so little intelligence.

Of all the travellers to the Levant who have published their observations, none that I recollect has presented a more learned and useful account of what the neighbouring countries contain than the Rev. Dr. THOMAS SHAW. The description he has given of the houses and way of life among the Mahometans is invaluable. He has, among other things, drawn a plan and explanation of a Mahometan dwelling, which shows it to be almost as much adapted to engender and accumulate pestilence as a Venetian Lazaretto. The houses in their cities, he observes (Travels in Barbary and the Levant, p. 273), are unfavourable to ventilation. Both in Barbary and the Levant, the method of building seems *to have been the same from the earliest ages, without the least alteration or improvement.* There is little communication by windows with the streets, for all of them open into *private courts*, if an exception be made of a latticed window or balcony *sometimes* toward the street.

The streets are narrow. On entering a house, a visitor seldom gets farther than a porch or gate-way, with benches on each side, where the master of the house receives company and transacts business. On *extraordinary* occasions, access may be gained to a quadrangular court, or inner space, lying open to the weather, and commonly paved, so as to carry off water and family-offal. Rarely or never does the company, even on such occasions, obtain entrance into one of the adjoining chambers, but remain in the open court, which is sometimes covered with a veil or awning. This court is called the *middle of the house*, and, on occasions of

great parade, *is cleaned out*, and spread with matts and carpets. This court or area is generally surrounded with a cloister or colonnade, over which, in high houses, there is a gallery erected, with a balustrade going round about it. From the cloister and gallery there are doors which conduct to the chambers or dwelling-rooms, *which very rarely have any connection with each other*. When a father permits any of his married children to live with him, or when several persons join in the rent of one house, *a single chamber serves for a whole family*. Hence it happens that the Mahometan houses and *cities swarm with inhabitants—that nastiness and home-bred infection are very common—and that such vast numbers of people are always swept away by the plague.*

At Cairo the narrow streets are thronged with passengers; several families live in one house, and a number of persons in each chamber of it (ibid. page 340). Among the poorer class, in the villages on the Nile, the houses are commonly constructed with *mud walls;* and with the same muddy material are the walls of the huts of the stationary Arabs partly built. In such circumstances, how is it possible to avoid pestilential distempers? The proof is as clear as it needs to be, that the plague of Asia is not propagated by a *morbid animal secretion*, like the virus of the small-pox and other contagions, but, like the yellow fever of America, owes its existence to the *septic exhalations* which proceed from the putrefactive processes going on in the clothing, chambers, provisions, excretions, and, in short, in almost every thing belonging to the wretched inhabitants. The *common putrid effluvium* is the exciting cause of disease in both cases. But as to *contagion*, there is not the least evidence of its existence. SANDYS relates (Travels, page 27), that the best of the private buildings at Constantinople are inferior to the most contemptible of the English. And as women are prohibited by the Koran to buy or sell, or show themselves publicly, what must be their condition of domestic economy?

Notwithstanding the locality of pestilential virus in all places favourable to its production, nations are railing at each other as being lazars or lepers. It has been said that the Minister Plenipotentiary of the United States at Madrid has presented a memorial to the Spanish government, the object of which is to procure a mitigation of the excessive rigour with which American vessels are compelled to perform quarantine in the ports of that kingdom. To this the Spanish government have made no reply. They intend, doubtless, to enforce the re-

gulations very strictly, to prevent the importation of the western plague from the atlantic cities of North-America! We may think this a grievance; but it must be allowed the Spaniards act consistently. There are physicians, merchants and legislators among us, who declare the autumnal distempers of our climate are contagious, and that ships, cargoes and crews, contain a great deal of that contagion. Now, under such assurances, added to their own prejudices, the Spaniards declare they will keep the evil out by all possible means. And who can blame them? They imagine their situation is such as to expose them constantly to the contagion of plague from the east, and of yellow fever from the west. This is an unhappy sentiment; but before the people of America complain of it, it becomes them to grow wiser themselves. When they have cleared the mote out of their own eye, they may venture to remove the beam from their brother's.

Amidst the oversights and blunders on these subjects, there is another which deserves particular notice: This is the article of provisions for human food. "Provisions," says Mr. Howard, "have never been suspected of being infectious;" therefore they have never been subjected to purification or destruction in any of the ports of the Mediterranean Sea. While cotton, both raw and manufactured, was subjected to the most rigid quarantine, beef and pork, and other articles of provisions, were never thought worthy of one moment's detention as containing any thing noxious. There is reason to believe there was a great omission here; and the damage done by the fluids exhaling from corrupting provisions has been falsely ascribed to contagion, and traced to Turkey. On this point you and I have a right to judge. America is a country abounding in provisions, which are exported to the greater part of the commercial world. The people of the United States are greater consumers of animal food in their diet, than, perhaps, any civilized nation upon earth; therefore, as a great quantity of animal food is consumed, salted and inspected, and much of what is inspected is afterwards exported from our hot climate to the hotter regions of the South, we have opportunities of knowing much about them in all their varieties and degrees of corruption. We well remember that the healthy town of New-London was almost depopulated in 1798 by the putrid vapours exhaling from *corrupting codfish.* (Med. Rep. vol. ii. p. 372—378, 2d edition.) From putrefying *hides*, *beef*, and *fish*, the same year, the town of Boston was poisoned by septic effluvia (ibid. p. 442—448.) The same year our own city

was rendered unhealthy by the gasses emitted from large quantities of rotten beef; a pestilential disease broke out, and many of the inhabitants lost their lives. These causes which poison cities can render ships sickly and uninhabitable. Several ships of the American Navy have been already visited by mortal sickness in consequence of provisions spoiling on board. I have a very correct statement of sickness bred within a ship on her passage from Liverpool to Philadelphia, in consequence of a barrel of stinking beef stowed below the steerage. And it is understood to be an occurrence of course, that American vessels which carry salted provisions to the West-Indies, or other foreign markets in hot latitudes, are most likely to lose their seamen by diseases. From these and numberless other facts of the same import, it is rendered very evident that provisions, though not at all suspected of being infectious, are often changed by corruption into pestilential air, spreading sickness and death to human beings within its influence. The Europeans have been so intent upon their fancied *contagion*, that they have overlooked the process of *putrefaction* almost entirely; and have unfortunately ascribed to the former the mischievous effects occasioned by the latter.

From these sources the atmosphere becomes contaminated, without the knowledge, and oftentimes without the belief of the people who breathe it: It is changed then from an enlivening composition to a mixture of poison, verifying the words of the philosophical poet:

> It is not *air*
> That from a thousand lungs reeks back to thine
> Sated with exhalations rank and fell,
> The spoil of dunghills, and the putrid thaw
> Of nature; when, from shape and texture, she
> Relapses into fighting elements;
> It is not *air*, but floats a nauseous mass
> Of all obscene, corrupt, offensive things. ARMSTRONG.

If thus the existence of contagion is disproved, the regulations concerning areas and stores for unladed goods and merchandize, will be as plain and intelligible as the airing of featherbeds and blankets in ordinary house-keeping. The chief attention should be directed to corrupting provisions, human excretions, clothing and bedding, and to hides and other things, which, when they putrify, are known to furnish pestilential air. From these ships derive their unhealthy taints, and have been known to poison several successive crews that have gone on board of them.

Vessels retain the pestilential taint, because, 1st, from their structure it is difficult to introduce a sufficiency of fresh air to waft away the infectious gas; 2d, from the manner of their construction it is also exceedingly difficult to scrub, scour, and cleanse them, by lime and alkalies, as houses are purified; and 3dly, from the preposterous custom of pronouncing a vessel clean after she has been pumped out, and fumigated with tar and brimstone; while, in fact, she is as foul *after* being smoked as she was *before*. The negligence of navigators and owners of vessels on these points, renders it absolutely necessary for public authority to interfere. All that I think necessary in the business, is, that the never-failing methods of *house-cleaning* should be applied to *ship-cleaning;* in the way that you have adopted with such happy success. And if the time shall arrive, when sea-vessels shall be kept as clean as genteel habitations on shore, their crews and passengers will suffer as little by infection and pestilence; and then the dream of importing diseases from foreign countries will be forgotten, or insisted on no more as a reality. And that this is not a mere conjecture, but a practical fact, is confirmed by the experience of the Dutch navigators; for they, carrying with them to sea the habits of that precise and unequalled cleanliness which prevails on shore in the United Netherlands, are rarely or never troubled with the fevers, the plagues, and the infectious distempers which incessantly harass the nastier nations of the earth.

ARTICLE II.

On Degeneracy *of* Constitution *among the* Poor *in* Great-Britain. *By Dr.* Beddoes.

[From the Medical and Physical Journal, vol. vi. p. 24.]

In no inquisitive age has there existed a moment more favourable than the present for illustrating a great physiological problem; I mean the influence of the condition of parents on the number and condition of the progeny. One cannot help fearing that, in consequence of the long and severe scarcity, a degradation of the species, partially begun in certain manufactories, will become general and permanent among us.

The political economist will attend to the proportion of births and marriages during this most disastrous period. The medical philosopher will look more closely into the subject.

Nor will any thing short of a body of information concerning the state of new-born infants satisfy him. Without stopping, therefore, to demonstrate the propriety of the investigation, I propose to those who have opportunities of observation the following queries:

1. Have the children of the poor, of late, come into the world more puny, meagre, or smaller, than in more plentiful times?

2. Have they appeared to die in greater numbers shortly after birth, and with what preceding symptoms?

I also wish to know,

3. Whether miscarriages have been more frequent among this class? And,

4. Whether the mothers have recovered more slowly, and been subject to greater losses of blood?

ARTICLE III.

The following, or similar Addresses, are distributed in the Metropolis, and many other Parts of the Kingdom of Great-Britain.

ADDRESS TO THE POOR.

[From the Medical and Physical Journal, vol. vi. p. 116.]

THE experience of several years has fully proved, that inoculation for the cow-pox is a certain *preservative* against the small-pox; and is, besides, so mild and safe a disorder, when compared with the inoculated small-pox, that it has been generally introduced among the better informed and more wealthy inhabitants, both of this kingdom and of various parts of Europe. In order, therefore, to impress strongly on the minds of the poor, the usefulness and superior advantages of this new plan of inoculation, it is thought proper to state, in this public manner, the following observations, for the serious perusal of all those poor persons who feel *a proper affection for their offspring*, and who are desirous of promoting their own interest and comfort.

1. *Inoculation* for the *cow-pox* has been practised for several years, with constant success, in various parts of this kingdom.

2. It has never failed to prevent the infection of the natural small-pox.

3. It may be communicated with safety to persons of every age and sex, and at all times and seasons of the year, with equal advantage.

4. The cow-pox is much preferable to the inoculated small-pox, as being a milder and safer disease, and not capable of infecting the persons living in the same family, or even sleeping in the same bed.

5. It does not produce eruptions which scar and disfigure the face; and is seldom, if ever, attended with any other marks of the disease than what appear on the arms from inoculation.

6. Neither swellings, blindness, lameness, nor any other complaints, which are known frequently to be the consequences of the natural small-pox (and sometimes, though but seldom, of the inoculated small-pox), have been observed to follow the cow-pox.

7. Alarming fits frequently seize children when sickening of the small-pox; and, while cutting their teeth, this disorder often proves dangerous: but no such objections lie against the cow-pox.

8. So far from proving hurtful, delicate and sickly children are often improved in health by having passed through this complaint.

9. Scarcely any remedies or attendance are required for the cow-pox.

10. There is no necessity for a course of physic either before or after inoculation.

11. The *time of the parents will not be taken up in attendance upon the sick*, to the injury of the support of the rest of the family: and to poor families, this is *an object of no small importance.*

ERRATUM.

In the review of Dr. Caldwell's Memoirs, page 204, fifteenth line, omit the word "justly."

MEDICAL REPOSITORY.

VOL. V.—No. III.

ARTICLE I.

A CASE *of* HYDROPHOBIA: *Communicated by* JOHN REDMAN COXE, *M. D. to Dr.* MILLER.

SIR, *Philadelphia, Sept.* 19, 1801.

The following case of hydrophobia, which came under my notice during my residence in London, is much at your service, should you think it worthy of insertion in the Medical Repository.

I am, with great respect,
Your very obedient servant,
JOHN REDMAN COXE.

London Hospital, Tuesday, Dec. 1st, 1795.

A BOY, aged about eleven years, was admitted at 4 P. M. labouring under an attack of hydrophobia. The account given of him was, that, about twenty months ago, he was bitten by a mad dog on the —— carpus; for which he was bathed in the salt water at Gravesend. He received a second bite, about a year ago, on the fingers of the same hand, and again was bathed at Gravesend. From that time, till Sunday last, he continued perfectly well; but, in the evening of that day, he complained of a pain in his stomach, and of being "sick all over." He dined and supped, on that day, very well, and passed a good night; but, on Monday, he suddenly escaped from his mother's arms, and ran into the street. Since which time he has taken nothing liquid, and scarcely any thing solid; but convulsions have been more or less frequent, together with a violent repugnance to all kinds of fluid.

His present symptoms are, constant convulsive motions, irregular as to strength; low and quick pulse, the heart, at the

same time, beating with considerable violence;* dilated pupils; pain of stomach, which he principally complains of, and which he ascribes to a quantity of wind rising like a ball in his throat and nearly suffocating him; uniform aversion to fluids; convulsions being induced by the mere sight of a cup brought to him to drink from; and a similar effect is even not unfrequent from the discharge of his saliva; no passage from the bowels since Sunday. He is perfectly sensible; but answers with difficulty to the questions proposed to him.

Mr. Blizard, one of the surgeons of the hospital, was fortunately in the house at the time the boy was admitted. He ordered a common laxative glyster, to obviate costiveness; and, at my request, politely agreed to try the effect of cold water, thrown suddenly over the patient, according to the plan proposed by Dr. Rush, in tetanus. The boy was immediately placed in a large tub, and one or two buckets full of cold water thrown suddenly over him from behind. Our anxiety was relieved by finding how well he bore it, without any convulsions, of which we were fearful. In about half an hour it was repeated, with apparent advantage. As a diminution of those constant convulsive motions I before noticed, appeared to take place, the pulse, at the same time, becoming more full, Mr. Blizard ordered it to be repeated every hour, and to administer a second injection, in a short time, with the addition of forty drops of laudanum.

At half past eight in the evening I saw him again; since when the bath has been repeated *three* times, or *five* times in all. His pulse, though considerably quicker (upwards of 140), seems not much altered in strength. The convulsions are less frequent and violent; and he *now drinks* without any very great degree of violence to himself; for although when a fluid was brought in a glass he appeared desirous to avoid drinking, yet, on being urged, he at length seized and drank several mouthfulls. His attendants say, he has both eaten and drank several times since we were last here. He is quite sensible, and though he prefers silence, yet he answers all questions with less aversion. His countenance has a wild and very peculiar expression; tongue whitish; he passes his urine with perfect ease, and without regarding the sound; though the sound of

* By applying the hand to the breast, in respiration, a sensation was communicated as if the bronchiæ were loaded with a fluid. In two cases, which I understood had terminated fatally in the hospital, dissection evinced an unusual quantity of fluid in the bronchiæ. In one of these, bleeding to a large amount, I was informed, had been used.

water pouring in the tub, in which he was placed, appeared, at first, to cause great agitation. The convulsions now appear almost entirely under the form of a constant hiccup, accompanied with a more violent retraction than usual of the head and neck.

He seems much distressed by something in his mouth, which he imagines is the hair of the rug and blanket of his bed, and endeavours continually to remove it, by passing his hand quickly and frequently over his mouth; as no hair could, however, be discovered on inspection, it most probably arose from the viscidity of the saliva, which adhered considerably to the fauces.—He notices no one but his mother, and her only when spoken to.

This being a *medical* case, the physicians of the hospital met about this time in consultation; and concluded to suspend the use of the cold water, and endeavour to excite a speedy salivation, by means of mercurial frictions; for which purpose, two persons were ordered to relieve each other, during the night, in rubbing in the ointment on various parts of the body; but before this could be effected, death released the unfortunate sufferer, about two in the morning. He died with ease; and his body was immediately removed by his friends, so that no information was afforded by dissection.

In the above case we may notice several circumstances.—1st. The time between the bite and the actual disease. Whether the *first* bite had any influence in the production of the disease is, perhaps, impossible to ascertain. At any rate, the *second* bite, at the distance of twelve months, is another mournful proof of the great length of time during which this very extraordinary virus is capable of remaining in the system, unaltered, and unassimilated to the general healthy state of the fluids. We have two authentic instances of a lapse of eighteen and nineteen months between the bite and the consequent disease.* As for the cases on record of twenty and even forty years interval, I must either dispute their credit, or consider them as accidental concomitants of some other disease, as hysteria, &c. which I shall speak of presently. It would, doubtless, be very desirable to ascertain, with precision, the utmost limits between the bite and the disease; as this knowledge would tend to allay, after the expiration of that time, the dreadful apprehensions of those who, at any preceding period, have unfortunately been bitten. Dr. Babington considers from four to twelve weeks

* Philos. Trans. vol. xl. p. 5. Lond. Med. Journal, vol. viii. p. 156.

as the interval in most cases which have occurred.* What becomes of the poison during this interval? Are we to suppose it remains in the part bitten till near the time of the disease taking place? If so, we must also suppose, that excision of the part, at any period prior to the commencement of the attack, would prove a certain preventative. How far this is actually the case I know not; but it certainly deserves more accurate investigation than has, I believe, been afforded it. At all events, it appears to me, that a removal of the part, *at any time*, is to be recommended, even though weeks or months have intervened.

2dly. Some of the symptoms occurring during its continuance deserve notice. As to the *dread of fluids* existing in this disease, we find a remarkable relief from the difficulty of swallowing was experienced towards its close. The same was observed in Dr. Ferriar's case,† and he refers to Mead, Lieutaud, &c. to shew, that "the disease has even been said to exist without any horror of water or difficulty of receiving it into the stomach." It is well known that this symptom has occurred, not only in hysteria and tetanus, but also in the yellow fever, in typhus, dysentery, and in hydrocephalus.‡ Dr. Rush has also enumerated a variety of other causes of this extraordinary symptom;§ and Dr. Cullen says, "We have known an instance of hydrophobia, in consequence of an inflammation of the stomach, independent of any bite of a mad dog.‖ The greater contraction of the muscles, of the glottis, in swallowing fluids, than is necessary in swallowing solids, by which, in their highly irritable state, such a spasmodic constriction takes place as to endanger, and eventually to occasion, suffocation, is sufficient to account for the difference of pain in these two actions. But, I apprehend, the association of ideas of pain, with the attempt to

* Medical Records and Researches, p. 130.

† Medical Facts and Observations, vol. i. p. 6.

‡ This was remarkably the case in a young boy, of about 10 years of age, in whom the usual symptoms of hydrocephalus supervened an attack of common inflammatory fever in March, 1792. He was vomited, bled, purged and blistered. About the 9th or 10th day from the first attack, he began to find *great difficulty in swallowing*, which continued to increase to such a degree, "that, whenever the smallest quantity of any fluid touched the muscles of deglutition, he was *thrown into convulsions*, and finally died of a fit which lasted about three hours, and was induced by attempting to *swallow a small quantity of cold water*." The viscera of the thorax and abdomen were healthy; but water was found in the pericardium and ventricles of the brain. MM. S. Cases.

§ Observations on Hydrophobia, p. 213.

‖ Clinical Lectures, p. 173.

swallow, is scarcely to be considered as adequate to the explanation of this symptom. That imagination has something to do with it, is evident from this, that even a looking-glass presented to the patient, will sometimes produce the same effect. In some cases, also, of angina, the pain of swallowing is excessive; yet I do not recollect, that the dread of fluids or solids ever amounted to an actual state of hydrophobia, although the recollection of past pain in swallowing must have been pretty considerable.

Whether the cold bath, employed in this case, had any effect in relieving this symptom, is, perhaps, difficult to ascertain. I have always considered it dependent on this cause, as it took place so soon after its use, and as its powerful effect in resolving spasm is well known. Its employment at so late a period of the disease, perhaps precluded the possibility of perfecting a cure; yet I consider the suspension of its application as a cause of regret. In Southwell's Med. Essays* it is noticed, that the horror of water was overcome by pouring water on the patients till they were almost suffocated; "thus, among others, a man was tied to a tree, and had 200 buckets of water thrown on him: he recovered without any other assistance."

The *dilated* pupil, in our case, would seem to indicate an affection of the brain; yet no pain of that organ was complained of. A similar dilatation, though in a much greater degree, is mentioned by Dr. Bensell, in the case related in the Medical Transactions of the College of Physicians of Philadelphia, in which no pain of the head existed. Again; dissection, in several instances, has shewn *much distension* of the vessels of the brain, in which, however, no mention is made of this symptom. Perhaps, in those cases in which it occurs, it may be merely a sympathetic affection of the brain, arising from the irritation of the parts more immediately concerned in the disease.

With respect to the remedies which, at different periods, have been proposed for the cure of this formidable disease, *repeated instances* have shewn their *inutility* and *inefficacy;* the further trial of these I must, therefore, be allowed to consider as absolutely *trifling* with the *life* of the unfortunate sufferer. Of this description are mercury and opium, at least if employed alone; for, possibly, combined with other means, they may prove useful; though, after reading Dr. Babington's case,† in which 180 grains of opium were given in less than 11

* Vol. iii. p. 93, 94, abridged from the Memoirs of the Royal Academy, Paris.

† Medical Records and Researches.

hours, without the least mitigation of the disease, or even producing a disposition to sleep, or Dr. Wavell's case, in which he administered, ineffectually, in about 24 hours, 54 grains by the mouth, and 10 in an enema; I think we might safely discard its use altogether in this disease.

As to the various cases which are reputed to have yielded to blood-letting, I must confess that I coincide in opinion with Dr. Mease, who has taken much pains to shew that the hydrophobia, in these instances, was derived from other causes than the canine virus. This being my opinion, it is clear that I cannot yet give my assent to the ingenious doctrine of the kindred nature of this disease with malignant fever. The limits of a letter do not admit my saying more on this part of the subject, further than that I wish much to see this opinion substantiated or refuted, by actual proof of the utility of blood-letting, carried to its utmost limits; and even to try the effect of transfusing the blood from an healthy animal, whilst the whole mass of diseased blood (supposing this the case) is suffered to escape.

I must here be allowed a few words on the subject of inflammation of the stomach, &c. which has been advanced as a proof of the connection of the two diseases. Were this the case, I should imagine that this symptom would have occurred much more frequently than we find it recorded. It is not perhaps one case of an hundred of yellow fever, terminating fatally, in which inflammation of the stomach and intestines is not detected; but, on the contrary, in hydrophobia, not more than one of an hundred will probably exhibit this symptom on dissection, and even then in so light a degree as to render it highly probable that it arises from the long continued action of the *undiluted* gastric juice, or from the remedies employed. Where this symptom takes place in a more considerable degree, it appears to me entirely dependent on the remedies made use of. Thus in the case related by Dr. Borrowe, in your last number,* the quantity of cantharides employed in one day, must, in so young a subject, have been fully equal to the production of gastritis; and this is rendered more probable from this symptom commencing during the night, subsequent to the administration of the tincture. That the black vomit in this instance depended upon the accidental inflammation of the stomach, unconnected with the other disease, I have no doubt; though Dr. Babington† relates that

* See Med. Rep. vol. v. p. 73.

† Medical Records and Researches, p. 123, 124.

his patient, a few hours preceding death, "began to bring up from his stomach large quantities of a thin *chocolate coloured* liquor," whose stomach on dissection shewed no symptoms of inflammation. Had this disease been of the highly inflammatory nature to require copious bleeding, we might reasonably have anticipated the most violent inflammation of the stomach and bowels, &c. in consequence of the enormous quantity of opium taken. Although the tincture of cantharides failed in the instance related by Dr. Borrowe, might this not have been entirely owing to the late period of its being employed? It certainly deserves a faithful trial from the earliest attack of the complaint; and I must consider physicians as under great obligations to Dr. B. and the other medical gentlemen, for the information to be derived from that unsuccessful case.

In addition to cantharides, both externally and internally, for the purpose of exciting a disease elsewhere, considering the hydrophobia in the light of a spasmodic affection, especially of the muscles of the glottis, I should certainly wish a fair and *copious* trial of the affusions of the coldest water, even as far as from two to six buckets full every quarter or half hour. If we can persuade the patient to swallow, I would employ large doses of the most highly diffusible stimuli, such as the oil of amber, alkohol, and æther, as more likely to prove useful than others not so quick in their operation on the system.

As this disease is so very rapid in its progress, every measure must be pushed to the utmost without delay. As soon, therefore, as the above plan was found likely to fail, I should assuredly think it right to try the operation of tracheotomy as proposed by Dr. Physick. If the disease is solely confined to the muscles of the glottis, the chief danger of the disease, viz. that of suffocation, will be obviated, and we may hope for a favourable termination to the spasmodic irritation in due time. Should the pain of swallowing, however, continue so excessive, owing to the diseased state of the muscles, although no danger of suffocation exists, might we not safely diminish the sufferings of the patient, by introducing both medicines and food *through a flexible tube passed into the stomach* either by the nose or mouth, and suffered to remain there till the disease had abated? By seldom removing it the muscles would seldom be excited to action, and, consequently, would sooner regain their healthy state. It is by no means improbable that a tube thus passed, might even preclude the

necessity of tracheotomy, as the spasmodic stricture is chiefly induced by the action of swallowing, which would by this measure be prevented; and that it is capable of being carried into execution I believe is beyond a doubt, from the same plan having been pursued, where violent injuries to the face, mouth, &c. have produced a total inability to take in nourishment. I cannot now recollect where to refer for this case, but I think it is in Dessault's Chirurgical Journal, which I have not at hand. As so many remedies have been employed in this hitherto hopeless disease, I think it worthy of a trial, considering, with Celsus, that "*Satius est enim anceps auxilium experiri, quam nullum.*"

I have now only to ask, as I do not recollect, whether in any of the dissections which have been made of persons falling victims to this disease, any notice has been taken of the actual state of the *salivary glands?* If so, I would enquire what it is, and whether the pancreas, which is considered in the same light, is similarly affected? As the virus is contained in the saliva, we must suppose it is produced by an altered secretion of the glands; and yet were that the case, how can we account for man not being able to propagate the disease to the inferior classes of animals? At least experiments,* at present few in number, give us some reason to think this is the case.

ARTICLE II.

MISCELLANEOUS OBSERVATIONS *relating to the* DOCTRINE *of* AIR: *In a Communication from* JOSEPH PRIESTLEY, *LL. D. &c. to Dr.* MITCHILL, *dated Northumberland, July* 30, 1801.

DEAR SIR,

FLATTERING myself that it will be agreeable to you to be informed concerning some of my late experiments, I shall mention the results of them, without troubling you with a detail of all the particulars.

1. I have long observed, as you see in some of my earliest publications, that making fixed air ever so pure, there is a part of it, generally the 30th, which will not be absorbed by water, but is permanent air; and even if that which has been absorbed by water be expelled from it by heat, the whole of

* Med. Records and Researches, p. 135, 136, &c.

it will not be absorbed again, but that the same proportion of it will become permanent air; so that, to appearance, the whole of it might, by repeating the process, be converted into permanent air. This is probably the case with every other kind of air that is readily imbibed by water. And I have found that this part of all those kinds of air is considerably increased by the application of heat; at least it is so when I heat in any of them a bit of crucible, which, having been frequently exposed to very great heats, cannot give out any air by any more exposure to heat. In order to be more sure of my conclusion, I always used the same bit of crucible, and I observed that there was no sensible increase of the bulk of the air in consequence of any of the processes.

Heating the bit of crucible, by means of a burning lens, several hours, in a quantity of fixed air, I found that, whereas of the original quantity only a forty-second part remained unabsorbed by water, the residuum was now a fifteenth part. I had a similar result in many other experiments with this kind of air, and the standard of the residuum was always lower than that of common air, generally 1.5; which is the same with the residuum of the air not treated in this manner.

Instead of the bit of crucible, I heated *finery cinder* in this kind of air, and had the same result, except that the standard of the residuum was lower, viz. 1.8 or 1.9; so that it must have been almost wholly phlogisticated or inflammable.

The increased residuum of *hepatic air*, treated in this manner, was slightly inflammable air.

I had a similar result in my experiments with *marine acid air*, and *vitriolic acid air*, though the residuums, as may be supposed, were very small. But though that of the marine air had been 0.05, that of the residuum, after this process, was 0.2. It was also completely phlogisticated; whereas the standard of that of the original quantity was 1.5. After the process, the bit of crucible, exposed to a red heat, burned a long time with a green flame.

Of the *vitriolic acid air*, the increase of the residuum was in the proportion of not less than 10 to 1. After the process, the bit of crucible, exposed to heat, exhibited no particular appearance.

That the element of heat, if there be any such substance, enters into the constitution of all aëriform substances, cannot be doubted. It is taken up by the vapour of water, and that of other fluids, which resume their fluid form when the external heat is withdrawn. What circumstance it is that makes

this principle of heat attach itself to any aëriform substance, so as to remain combined with it, and not to be separated from it in the common temperature of the atmosphere, or in any degree of cold that we can apply to it (in other words, what it is that constitutes any permanent air), is one of the greatest *desiderata* in the doctrine of air. That water, or rather vapour, is the basis of all the different kinds of air, or that which constitutes at least the greatest part, if not the whole, of their *weight*, I see every reason to believe; but in what manner any other principles so attach themselves to this vapour as to make them become the various kinds of permanent air, is the great question. Indeed, a knowledge of the *elements* which enter into the composition of natural substances, is but a small part of what it is desirable to investigate with respect to them, the principle, and the mode of their *combination:* as how it is that they become hard or soft, elastic or non-elastic, solid or fluid, &c. &c. &c. is quite another subject, of which we have, as yet, very little knowledge, or rather none at all.

2. I see, by various publications which I have lately received from Europe, that the constitution of *phlogisticated air*, called in the new theory *azote*, is the subject of much discussion. Many of my experiments, I think, clearly prove, that, like fixed air, it consists of dephlogisticated and inflammable air, as containing the principle of phlogiston; though I have observed that, in some cases, it seemed to be produced from inflammable air only, without any mixture of dephlogisticated air. I have lately made another observation, from which it seems to be probable that dephlogisticated air enters into its constitution. I therefore conclude that it must do so universally; and that in those cases in which I did not purposely introduce any dephlogisticated air, or any substance into which it enters, it came from the atmosphere through the water in which the process was made.

Having kept a large quantity of inflammable air several months confined by water, I found that it was by no means so pure, and proper for my experiments, as that which was recently made; and it appeared to contain a proportion of phlogisticated air. Some dephlogisticated air had probably got through the water, and had united itself to the inflammable air in the jar, so as to give it the mixture of phlogisticated air. I shall observe whether, in a course of time, the whole of the inflammable air will not, by this means, be converted into phlogisticated air.

In your Repository, vol. ii. p. 171, first edit. I mentioned an experiment which I made on the dispersion of a *diamond* by the heat of a burning lens in atmospherical air, from which I inferred that, in its constitution, it resembled *charcoal of copper*. Having been favoured with several larger diamonds by Mr. Jefferies, an eminent jeweller in London, I have lately made several other experiments which confirm that supposition. The most satisfactory of them is the following:

In $4\frac{1}{2}$ ounce measures of dephlogisticated air, of the standard of 0.6, with two equal quantities of nitrous air, I heated a diamond, which weighed one-seventh of a grain, till it entirely vanished; after which the air was reduced, by means of lime-water, to $1\frac{1}{2}$ ounce measures, of the standard of 1.92.

The weight of the fixed air produced in this process greatly exceeding that of the diamond, it is evident that the substance of it must have united with the dephlogisticated air, to form the fixed air. As the weight of this air was nearly three grains, and that of the diamond about a fourth part of it, the proportion of dephlogisticated air in fixed air must be the same that I found it to be in my former experiments.

According to this experiment, the diamond and charcoal of copper, though so different in appearance (the one solid and beautifully transparent, and the other a black and friable substance), are, as nearly as possible, pure phlogiston. For though something, no doubt, remains after their dispersion, it is too small to be discovered.

Submitting these experiments and observations to your better judgment, and that of the readers of your valuable Repository, I am, with great esteem, dear Sir, yours sincerely,

J. PRIESTLEY.

ARTICLE III.

An Account *of* Bilious Colics, *as they appeared in several Towns in the County of Cumberland, District of Maine, in the Months of May, June and July,* 1801; *and of the surprizing Relief obtained therein by Alkaline Remedies. By Dr.* Jeremiah Barker, *of Portland.*

DURING the months of January and February the weather was very cold, and the snow of considerable depth. General health prevailed, excepting that the chicken-pox appeared in several towns.

The months of March and April were unusually warm and rainy. Catarrhal affections were prevalent among adults, and several cases of croup occurred among young children.

In the months of May, June and July, which were also rainy and very warm, the bilious colic, as it is termed by systematic writers, was prevalent, and, in some instances, highly malignant.

The disease was ushered in with pain in the bowels, nausea and vomiting. The matters discharged from the stomach were green, and said to be attended with a burning heat. As the disease advanced the patient became feverish and thirsty, and the abdomen swelled. The matters then ejected were of a dark green hue, and emitted a very rancid smell. The bowels were generally constipated from the commencement of the disease.

The subjects of this disease were those whose digestive powers had become weakened, and who, in most cases, indulged freely in fresh meat and fresh fish with salads.

A suitable emetic, combined with alkalis, and worked off with an aqueous solution of sal absynth. soda or lime, or with the cretaceous julep, frequently eradicated the disease, even when it was so far advanced that the abdomen had become tense; and this was generally effected without any cathartic operation being produced. When the stomach was not greatly loaded with noxious matters, a liberal use of alkaline salts or earths would sometimes remove the complaints. Oils likewise, in such cases, often afforded relief, without effecting any sensible operation upon the intestines. But cathartics, independently of these remedies, seldom mitigated the complaints, although they operated freely. This I had several opportunities of seeing verified; for attempts were made, by some, to cure themselves in this way, imagining that the disease proceeded from the intestines being overcharged with bile; so that discharging this supposed offending fluid by cathartics, particularly by *bilious pills*, was considered, by them, as being the most eligible mode of procedure. Unhappy consequences, however, were experienced, in several instances, by their attempting to displace a fluid by no means accessary to the mischief; while some things were left undone which it had been better to have done.—A few cases will serve to exemplify the practice.

In May a middle-aged man, in a neighbouring town, was attacked, in the morning, with the usual symptoms of this disease. I was called the second day, and arrived at 12 o'clock.

As I entered his room he was vomiting matter of a dark colour and fœtid smell. His pulse intermitted, and he was in a cold sweat. He died within an hour. He had taken bilious pills, which operated through his bowels, yet no relief was procured. He also drank some cyder, because he was told that acids were recommended by Dr. Buchan in bilious colic.

An aged man, in a distant town, complained of a slight pain in his bowels, thirst and fever. He took a dose of bilious pills, which afforded some relief. After this an officious neighbour directed twenty drops of elixir of vitriol in a cup of water every hour. The pain then increased, with a sense of heat and oppression of the præcordia, nausea and retching. I was called the third day, in the forenoon, when his abdomen was tense, and very sore to the touch. His throat and mouth were considerably inflamed, and his pulse was very quick and weak. He died in the afternoon.

In June a young man, remotely situated, was attacked, in the morning, with pain in his bowels and vomiting. The matters ejected were green. Spirits and opium were taken, but no relief was procured. At 12 o'clock he was bled, and castor oil was liberally given. In the afternoon he became very thirsty, and his abdomen swelled. The matters then ejected had acquired a bottle-green colour, and a very rancid smell. The next morning his limbs became spasmodically affected, and he died at 8 o'clock. Immediately after death his body acquired a purple colour. This man had indulged freely in fresh fish, with salads, the preceding day.—I rode several miles to obtain an accurate account of this case.

About the same time a middle-aged woman was seized, in the morning, in a similar manner, having undergone considerable fatigue the day before, and supped upon fresh fish. She took severally two doses of bilious pills, which were readily ejected by vomit, affording some relief. The pain in her bowels, however, returned in the afternoon, notwithstanding half an ounce of paregoric elixir was taken soon after the ejection of the second cathartic. A dose of castor oil was then given, and although it operated several times cathartically, her complaints were not mitigated. At two o'clock the next morning, when I was called, she complained of great pain in the bowels, which were tense, and sore to the touch. She ejected whatever was taken into the stomach, and was very thirsty. The matters ejected were of a dark green colour, and of a rancid smell. I gave two grains of tartar-emetic, with

twenty of sal absynth. which operated six times freely; each ejection being followed with half a pint of warm water, impregnated with a like quantity of the alkaline salt. The vomiting and thirst then ceased, and the pain as well as tension were almost wholly removed, although the emetic did not operate cathartically. As she was somewhat faint and fatigued, a little essence of peppermint was given in cool water. This revived her stomach, and she soon took some boiled rice. The next day she was able to walk the room, and very soon recovered her strength. This patient observed, that when she threw up the first dose of pills, the matter tasted like *sour rennet.*

On the same day of her attack, a servant maid in the house was seized with pain in the bowels and retching. She also took a bilious cathartic. The next morning, however, she complained of increased pain in the bowels, and of having passed several bloody stools. She was thirsty and feverish, and ejected her drinks. I gave her thirty grains of ipecacuanha, with twenty of sal absynth. working it off with the alkaline solution. She vomited five times, and found relief. A table-spoonful of castor oil was then given, with twenty-five drops of laudanum. She had a comfortable night, and next day was free from complaints.

A few days after, a child in the family, five years old, was seized with excruciating pain in the bowels, and vomiting. I was called in two hours, and gave one grain of tartar-emetic, with ten of sal absynth. which operated four times, following each ejection with the chalk julep. In less than two hours the child returned to its play. No cathartic operation was produced.

A child, in another family, aged seven months, was attacked with pain in the bowels, vomiting and looseness. The stools were bloody and slimy. I was called in twelve hours. On account of the weakness and frequent vomitings, an emetic was objected to by its nurse. Castor oil, however, as well as magnesia and rhubarb, enemas and opiates, were duly employed, yet no permanent relief was obtained. The third day the abdomen swelled, although the intestinal discharges were frequent. On the fifth day it was seized with convulsions, and died on the seventh.

Soon after, a child, six months old, was seized with pain, nausea and diarrhœa. I was called in three hours, when the pulse could scarcely be felt, and the eyes were motionless. I proposed an emetic, which was objected to. In positive terms

I insisted upon its being given. An emetic of ipecacuanha was then given, with the chalk julap. In fifteen minutes it ejected green matter, revived with flowing pulse, and smiled upon its faithless mother. It was no further molested with disease.

A labouring man was attacked with pain in his bowels, oppression of the præcordia, and retching. He took a dose of bilious pills, which operated cathartically. His pain then increased, and he voided blood. I was called the next morning, when he was feverish and thirsty. His bowels were tense, and tortured with a burning pain. I gave thirty grains of ipecacuanha, with fifteen of sal absynth. which operated six times, ejecting dark green matter. Fifteen grains of sal absynth. were given, in half a pint of water, after each ejection. He was then greatly relieved. After this an ounce of castor oil was given. No more blood was voided, and the next day he was free from complaints, excepting debility.

I was called to a butcher, severely harassed with colic pains, who, in an attempt to describe his disease, exclaimed that he had a "*sour maw.*" His complaints were removed by three grains of tartar-emetic, with twenty of sal absynth. following each of the vomitings with copious draughts of lime-water. The next day he had a natural stool.

A young man, in a neighbouring town, was attacked with a burning pain in his bowels, and vomiting. The matter ejected was, as he says, "as black as ink, and set his teeth on edge." He took two grains of tartar-emetic, which ejected a large quantity of this black matter. He then found relief, and soon recovered.

Some of this matter fell upon a white cotton garment, which received a deep black dye. Some days after it was washed with water, but the colour remained unaltered. It was then washed with soap-suds: this changed it to a permanent olive green.

This man's diet, for several days previously to his attack, had consisted chiefly of fresh meat and fresh fish; the latter rather damaged, by being conveyed a considerable distance into the country. Two days before his attack he complained of heart-burn, oppression at the stomach, flatulency, and eructations.—I took half a day's journey in order to obtain an accurate statement of these facts.

On the 20th of June a woman was put to bed in her ninth month, who, during her two last months of gestation, was afflicted with a burning heat in the bowels, thirst for water, and pains about the umbilical region, for which she took no

medicine. After parturition, which was favourable, the pain and thirst increased, and she was attacked with fever, nausea and vomiting. The matters ejected were of a dark green colour, and very rancid. The stomach was cleansed with ipecacuanha and sal absynth. and the intestines with castor oil. Alkaline salts and earths were then liberally given, and satiation with cool water was allowed. Her complaints were removed in six days. She was placed in a large airy room, debarred from a feather bed, and even from a shred of a curtain. The infant, when born, was found to be remarkably hot and feverish. The mouth and throat were lined with dark coloured *apthæ*. There were vomiting and looseness. The stools were of a dark green colour, and very fœtid. The penis turned black, emitted a very putrid smell, and separated, about half an inch from the belly, in twelve hours! Some hæmorrhage ensued, but it was stopped by another ligature, though with difficulty, as the remaining part was putrid. The sixth day the child was seized with convulsions, and died the seventh.

Did not this woman's complaints, in pregnancy, indicate the use of alkalines? and was not a poisonous acid conveyed from the primæ viæ to the blood, and from thence to the *fœtus in utero?*

In July a young woman of a delicate habit was invaded with pain in the bowels, and vomited profusely. She took mint tea and elixir paregoric, but to no advantage. I was called twelve hours from the attack, when her strength was greatly exhausted. She had vomited, as she said, more than a dozen times; still she felt a burning pain in the bowels, and very thirsty. Two drachms of prepared chalk were then given in a cup of cool water, which was readily ejected. The dose was repeated, and retained half an hour, affording some relief. She then threw up a little water. A third dose was given, and her complaints were removed.

An aged man was attacked with a burning pain in his bowels, and vomited several times, which afforded some ease. He then took a dose of bilious pills, which operated cathartically; but, to his astonishment, the pain increased with his looseness. The next day, when I was called, he was feverish and thirsty, and complained of a violent *tenesmus*. I directed cretæ ʒ i, sal absynth. ℈i. every hour in cool water; also enemas of soap-suds as often. His pain gradually abated, and in six hours he was free from complaints.—His food was buttered gruel.

SINGULAR CURES.

A sailor, as he says, was attacked with the *rebellious colic;** and, having no physician on board, drank a pint of strong soot tea, which readily effected the cure.

A man, engaged in making pot-ash, was seized with colic, and, as no physician could be procured, took some *ley*. This afforded speedy relief.

A youth, affected with this disease, was relieved by taking an ounce of rattle-snake's oil; and a hunter, molested with colic, cured himself by drinking half a pint of bear's grease. Were it necessary I could particularize many other cures wrought upon adults, as also upon young children, in this disease, by alkalines and oils, without any cathartical operation being produced, or the employers having a distant idea of the principle upon which the means effected the cure.

By taking into consideration the predisposing causes of this disease, together with the beneficial effects of emetics, alkalines and oils, as also the inefficacy of cathartics, I am induced to believe that the STOMACH, and not the intestines, is the seat and throne of what is called bilious colic; and as bilious colic, according to the learned Dr. Rush, is "*only a modification of one original genus of bilious fever*,"† I think we may rationally conclude that the exciting cause is the same; and this cause appears evidently to be a poisonous acid.

What grateful acknowledgments, then, are due to the benevolent Author of our existence, for the admirable constitution of our bodies, by which that important viscus, the liver, is furnished with a natural alkaline antidote, capable, in ordinary circumstances, of counteracting the destructive tendency of this noxious acid!

Wonderful indeed is it, that when this septic poison is formed, and commences its ravages in the stomach, the bilious fluid should quit its accustomed intestinal route, and repair to the invaded organ, in order to exert its alkaline power in quelling and neutralizing the noxious poison, lest it should disorganize the stomach, or proceed into the intestines to their annoyance, and from thence penetrate into the circulating mass, so as to poison the whole body.

To co-operate, therefore, with this health-restoring bile, in extraordinary circumstances, and to reinforce its alkaline power, is, in my view, our indispensible duty.

* A more appropriate term, I think, than bilious colic.

† Account of Yellow Fever, p. 150.

In the course of my practice, in former years, I have dissected several persons who died of what is called bilious colic; but no accumulation of bile, nor any extraordinary appearance, was discovered in the intestines, excepting an excoriation of the rectum in some cases where tenesmus had been a troublesome symptom. Dark green bile, however, was found in the stomach, which was often injured; in consequence, I presume, of the virulent acid not being subdued by the bile; and no auxiliary, in those cases, had been afforded. On the contrary, exertions were always made by cathartic agents, sometimes by quicksilver, to repulse that neutralizing fluid and effect its expulsion.

I have been much perplexed, in years past, in attempting to account for tenesmus taking place soon after the operation of cathartics, even mild ones, in colics, in bilious and puerperal fevers, and in other gastric diseases, where emetics or alkalines had not preceded their use. Of late, however, I have been induced to believe that a poisonous acid being conducted from the stomach to the rectum, gave rise to the irritation and excoriation of that portion of the intestines.

In a fatal case of puerperal fever, sixteen years since, in which cathartics were chiefly relied on, a violent tenesmus took place, so that the rectum was corroded entirely through its coats, as appeared by dissection.

Might not a virulent acid, in this case, have been conducted from the stomach to the rectum, with the cathartics, and lodged in the rugæ or folds of that common sewer, so as to be productive of this direful effect? If so, would it not be much more eligible, in all cases of this kind, where the force of the disease is particularly exerted upon the stomach, to remove the offending virus by emetics, or to neutralize it, in that viscus, with alkalines; or at least to envelope it with oils, rather than to attempt an expulsion of this corrosive poison through the intestinal track, lest it should prove mischievous on its passage?

I do not mean to suggest that cathartics are useless in disease; but I maintain, that in all those distempers in which poison is either generated in the stomach, or admitted into that receptacle to its annoyance, emetics, alkalines or oils should *always* precede the use of intestinal evacuants.

I speak not only experimentally but *feelingly*, for in former years I have lost several patients in bilious colic, and in bilious and puerperal fevers, subjected to cathartic means, without previously cleansing the stomach, or neutralizing its acid contents.

For a few years past, however, I have adopted an opposite mode of practice in such cases; and I have the happiness to believe that it has rescued many from being poisoned even unto death.

Most certainly, if, by accident, arsenic, or any other acrid poison, should be taken into the stomach, we should choose to eject it by vomit, rather than to run the risk of giving relief, by having it conducted through the intestinal canal; and as the morbid condition of the stomach, in bilious fevers, has been found, by dissectors, to bear an exact resemblance to the ravages made in that organ by arsenic, I think we may safely and rationally conclude that a similar mode of treatment would be expedient. Indeed, if the case should have been neglected until inflammation had taken place in the stomach to any considerable degree, an emetic might then be ineligible. In a case thus circumstanced, oils, cool water and enemas, together with blood-letting and epispastics, would doubtless be the most salutary means.

It may be said, by some who dispense with emetics in colics and in fevers, on account of the irritable state of the stomach, that oily and alkaline cathartics may subdue and remove the offending matters. This, in slight cases of poisoning, has been found to be true. But when the stomach is considerably disturbed with the noxious virus, and threatened with inflammation and organic lesion, experience and observation have taught me that it is much safer to eject the venomous matter by emetics, than to confide solely even in alkaline and oily cathartics.

Moreover, I have found, in many cases of colic and fever, where the stomach was very irritable, that, after the operation of a suitable *alkaline* emetic, this irritable state has been appeased, and the stomach become retentive of other means, which before had been repeatedly ejected.

In July, a child, four years old, was attacked with pain in the bowels and vomiting, to which succeeded thirst and fever: it died on the sixth day. As the death of the child was supposed, by its parents, to be occasioned by worms, I was requested, by the attending physician, to examine it by dissection. On inspection, the villous membrane of the stomach was found inflamed, and besmeared with dark green matter. No worms were discovered, nor any other extraordinary appearance, excepting that the intestines were distended with air. Castor oil, rhubarb and magnesia had been employed, as also enemas.

I attended an adult patient, in bilious colic, sixteen years since, who died on the seventh day. Upon dissection I found the villous membrane of the stomach inflamed and corroded, while the intestines exhibited no marks of disease, and no medicines were used in this case which could injure the stomach; for blood-letting, Glauber's salts, enemas, warm baths, and epispastics, were the chief means employed; with a view of removing spasms, and disburthening the *colon*.

If, then, these misleading terms, *bilious colic* and *bilious fever*, should be expunged, and terms more expressive of the nature and seat of these diseases substituted, great good, I conceive, would redound to mankind. Much light, also, might be thrown upon the minds of such practitioners as are not furnished with modern authors, who, by their laboured researches, have been enabled to detect the fallacy of these ill chosen terms.

With a view to enlighten the minds of my patients, in these diseases, I have, of late years, described their cases as being *a poisoned state of the body*. Antidotes, therefore, have been earnestly sought for, and taken with avidity.

It may be proper to observe, that in some slight cases of colic, relief was obtained from aloetic and mercurial cathartics, though not readily, and, in several of these instances, the disease returned twice in the same patient; so that recourse was finally had to emetics, alkalines and oils, for a radical cure. But not in a single instance has a relapse occurred when these remedies have been employed.

As preventives of this disease, I have recommended the use of lime-water, or an aqueous solution of alkaline salts, and none have been invaded with disease, who have used these means.

An intelligent sea captain informs me, that he had made a daily use of lime-water, in the West-Indies, instead of spirits, when the yellow fever prevailed, and was induced to believe that it prevented his being infected.

For several years past I have practised taking lime-water, or a solution of pearl-ash, in sick rooms, and have never experienced any inconvenience from the noxious effluvia, even when emitted from a putrifying corpse.

Moreover, I feel a firm persuasion, that if these health-preserving drinks were substituted for punch and wine, or other spirituous potations, especially in sickly seasons, there would be little danger of bilious fevers, or any other gastric diseases.

I am supported in this suggestion by Citizen Guinot, who

recommends, in strong terms, from his own experience, as well as that of others, the use of *fixed vegetable alkali*, as a preservative against the invasion of puerperal fevers, as well as in the treatment of them;* and every enlightened physician, at this day, I presume, considers puerperal fever, bilious fever, and bilious colic, as kindred diseases, depending upon one common cause.

Thus, gentlemen, as a faithful gleaner in the medical field, I have collected and described the foregoing cases, with as much accuracy as I possibly could, not hesitating to expose my own errors; and now submit them to your candid consideration.

If these cases, together with the annexed observations, should tend to awaken any one, who may still be dormant in the chains of ancient authorities, respecting the nature and treatment of these formidable diseases, so as to make improvements for the alleviation of human misery, I shall then be amply compensated for my labour.

ARTICLE IV.

CASE *of* LUMBAR ABSCESS: *Communicated in a Letter from* EDWARD CUTBUSH, *Surgeon of the Frigate United States, to Dr.* MITCHILL, *dated July* 9, 1801.

JAMES Y——n, seaman on board the frigate United States, aged 27, was attacked, July 21st, 1800, with pain in his back and head; pulse full and quick. From this time to the 7th of August, the pain gradually extended towards his hip and thigh, which at length became very much swoln. During my absence from the ship, one of my mates, supposing it a rheumatic affection, very judiciously bled him freely, blistered the parts affected, and pursued strictly the antiphlogistic mode of treatment, without procuring any permanent relief.

August 10th. I visited him, and discovered a very evident fluctuation of pus, which had insinuated itself under the tendinous fascia of the thigh, and extended almost to the patella and inferior part of the sacrum: when he coughed, a fluctuation could be distinctly felt near Poupart's ligament, and his thigh appeared evidently enlarged after coughing. He has

* Med. Repos. vol. iv. p. 85.

frequent chills, and is very much troubled with a cough, pulse frequent, skin hot, especially the palms of his hands. On examining him, he reminded me of an injury he received in his back, by a fall into the fore-hold, which, he said, had been frequently troublesome to him.

Taking all the circumstances of his case into view, I had no hesitation in pronouncing the disease lumbar abscess; the integuments on the anterior part of his thigh being thin, I introduced a flat trochar, and discharged three half pints of mild inodorous pus; the canula was then *plugged*, and *left in the thigh*, and a flannel roller, applied moderately tight, from his knee upward.

11th. He coughs and expectorates frequently; the discharges from his lungs have a puriform appearance; pulse small, and 120 in a minute; he sweated profusely last night; tongue *clean* and *florid*. The plug being taken from the canula, half a pint of pus was discharged. Dressings as yesterday. Directed infus. cort. Peruv. cum. serp. virg. and elix. vitriol. to be frequently taken; half a pint of wine per day, and a light nourishing diet.

12th. He complains of great weakness; cough and expectoration continue; pulse 132 in a minute. One pint of pus was discharged from his thigh this morning. Medicine and diet continued.

13th. Cough continues; expectoration has more the appearance of pus; pulse still feeble, and very frequent; sweats profusely at night. This morning the pus flowed freely through the canula, but was not measured. Dressings as before. The infusion of bark, &c. did not set easy on his stomach; I therefore directed him to use a strong decoction of the bark of the* *wild cherry tree*, and to continue the elix. vitriol. wine and nourishing diet.

16th. The discharge of pus has diminished daily, since the 13th; the sides of the abscess appear to be uniting near the puncture. He says he has not sweated so much since using the *wild cherry tree decoction;* his appetite is increased, pulse not so frequent.

17th. On opening the canula, very little pus was discovered; from the firmness of the parts adjacent, I was convinced that the sides of the lower part of the abscess were united; therefore withdrew the canula, and closed the puncture with adhesive plaister; but a fluctuation of pus can be distinctly felt

* Prunus Cerasus Virginiana.

in the groin, and thigh, near the trochanter major, also near the sacrum. I again punctured the thigh, with a flat trochar, near the groin; half a pint of pus was discharged, the canula plugged as before, and a roller applied. Evening, being in pain, an opiate was given.

18th. Nearly half a pint of pus was discharged this morning; the bandage was applied somewhat tighter; medicine and nourishing diet continued.

19th. The cough is worse, he does not expectorate so freely, sweats less, but evidently appears to be gaining strength; half a gill of pus was discharged.

20th. His pulse has become more natural; a gill of pus was discharged this morning; the parts dressed as before, medicines &c. continued.

21st. He complains of pain in his bowels, which arises from their costive state; half a gill of pus was discharged from the groin. Directed a gentle cathartic, and after its operation to return to the use of the cherry bark decoction.

22d. The cough is better, pain of his bowels removed, appetite increases; sweated very little last night; nearly a gill of pus was discharged; applied the bandage tighter, with compresses on the glutœi muscles; he complains of a slight pain in his back, extending to the groin.

23d. He rested well last night, without sweating; appetite for animal food increases; a small quantity of pus was discharged this morning; bandage and compresses applied as yesterday, directed him to take beef tea, wine, &c. continued.

24th. Continues better.

25th. He very imprudently got out of bed last night and attempted to walk with crutches, which has produced a severe pain in his loins and groin; the discharge of pus is very small, the integuments of the thigh have become stiff; directed the parts to be bathed with sweet oil and laudanum.

31st. Since the 25th, he has gradually recovered his strength, pulse almost natural; when the canula was opened, a very small quantity of *serous fluid* was discharged; he is free from pain in his loins and thigh. I withdrew the canula and closed the puncture by adhesive plaister. Beef tea, wine and medicines, to be continued.

September 3d. His strength increases very fast, has no night sweats, coughs a little, which appears to be from habit; he walked yesterday without experiencing any inconvenience.

8th. He recovers rapidly, the puncture is healed; his good wife informs me, "*that he is getting strong in the back.*"

20th. He appears to be in a very good state of health, and solicits to remain on shore, which is granted him.

May 14th, 1801, I met with him in Philadelphia, in very good health; he informed me that he had not experienced any inconvenience from the disease.

ARTICLE V.

An ACCOUNT *of a* BILIOUS YELLOW FEVER *which prevailed on Board the United States Ship Delaware, in the Island of Curacao, from the beginning of Nov.* 1799, *until the latter end of February,* 1800: *Communicated by* SAMUEL ANDERSON, *Surgeon's Mate.*

PREVIOUS to entering upon a description of this fever, I shall make a few geographical remarks respecting the island of Curacao, give a short account of the weather which preceded and that which accompanied the disease, and relate a few other circumstances, which may perhaps lead to a discovery of its cause, which unfortunately I have not been able to ascertain, from a want of that experimental knowledge, by which only we can with certainty find out the cause of fever.

This account of the weather will not only be brief, but very imperfect, as it is not supported by a single thermometrical observation.

It is observed by Dr. Rush, in the fourth volume of his Inquiries, that those parts of the West-India islands which are removed from the neighbourhood of marsh exhalations, are uncommonly healthy. The island of Curacao has, until very lately, afforded a striking instance of this; for a confirmation of which I have the testimony of a considerable number of the most respectable inhabitants, and in particular that of Dr. Forbes, who I hope will ever do honour to the profession of Medicine. He informed me that during a residence of three years and upwards in that place, he had witnessed but few deaths, and those principally in consequence of old age; and that he had never known the yellow fever to prevail among the inhabitants.

The island of Curacao is thirty miles in length from east to west, and ten in breadth from north to south. It is diversified by numerous hills and mountains. Its soil in general is very poor and barren, and its vegetable productions very inconsi-

derable. Amsterdam, which is the only commercial town of the island, lies in 12 deg. north latitude, or thereabouts. It is divided by a bay or inlet which runs up a small distance. This bay affords a very convenient and safe harbour for vessels of the largest size. That part of it which divides the town, and in which the shipping lies, does not exceed, in breadth, more than eighty yards; but at the distance of half a mile, or three quarters, from its junction with the sea, it widens to a considerable extent, and is beautifully diversified by small islands. On the east side of this inlet, and about two hundred yards from the sea, is a large pond, which communicates with the former by a very narrow passage. It is about half a mile in length and a quarter in breadth.

The principal and oldest part of Amsterdam lies between this pond and the sea; but to a stranger the pond appears to occupy the central part of the town, as it is entirely surrounded by buildings. This pond has for some time been a receptacle for every kind of filth and nastiness, and in it I hope to detect that noxious principle which gave rise to the disease in question. The month of November, 1799, was uniformly warm and dry. The days were not succeeded by cool evenings, like the summer days of Pennsylvania. The drought was so great during this month, and for some time previous, that many of the poorest class of people suffered in consequence of a scarcity of water, as their principal dependence was on rain.

The beginning of December was uncommonly warm. The heat of the sun between the hours of 12 and 3 P. M. was almost insupportable. The atmosphere was not possessed of that elasticity, the happy effects of which (as Dr. Rush informs us) are experienced by the Pennsylvanians, except when the heat is accompanied with moisture and a south-west wind. In consequence of the want of this principle, the heat was oppressive and very distressing. Fountains, from which large streams of water had generally flown, were nearly dry. The island was nearly deprived of its verdure. Almost a total stop was put to vegetation. To horses and cattle this drought was very destructive, but to mules and sheep it was not mortal.

The ground became so heated as to cause the hoofs of many of the cattle to fall off, in consequence of which the proprietors were obliged to deprive them of their miserable existence.

That equilibrium which prevailed so generally in the temperature of the air, during the month of November, was un-

known in December. The nights were remarkably cool, and those were generally the coldest which succeeded the warmest days. During this month and the two succeeding months, the dews were uncommonly heavy, and often so great as to appear like a thick fog or mist. It was always heaviest about an hour before day.

I shall say nothing respecting the months of January and February, as they differed but little from December. All I shall say concerning the wind is, that in general it blew from east north-east—seldom exceeding, in variation, four points. Sometimes it blew with considerable violence, which was happily attended with a mitigation of the distressing sensations produced by the heat of the sun.

For a more easy discovery of the cause of this fever, it will be requisite to make a few remarks respecting that pond, the situation of which has already been described.

No current was perceivable in it, but at some times it was higher than others, in consequence of the flowing and ebbing of the sea. Though a strong breeze of wind commonly passed over it, it seldom affected the pond, owing to high land, and a number of large buildings, which stood to the eastward of it. From a want of the influence of the wind, from the stagnation of the water, and from the powerful operation of the sun on the vegetable matter with which this pond abounded in excessive quantities, there was a constant discharge of the most noisome effluvia—often so great as to produce nausea.

This noxious matter, after rising a few feet from the surface of the water, was arrested by the wind, and carried directly over our ship; in consequence of which the unfortunate crew of the Delaware were obliged to breathe an atmosphere replete with the seeds of fever.

With respect to the provisions of the ship, they were, in general, bad. The salt meat was often highly tainted, and far advanced in putrefaction. But little fresh meat could be procured, and that commonly unfit for use.

Vegetables were not to be had at any price. The water was bad, and often so offensive as to invert the peristaltic motion of the whole alimentary canal.

I shall conclude this relation of circumstances by observing, that during the prevalence of the disease a very nauseous smell was experienced between the decks of the ship, often so offensive as to produce vomiting when I was employed in administering medicines to the sick.

As very offensive effluvia, in general, prevail where a num-

ber of sick are confined together, it might be supposed that they proceeded from that source; but I am convinced that they did not, as they were noticed for some time previous to the commencement of the disease, for a considerable time after the sick were removed on shore, and though great pains had been taken to disperse them.

I shall now proceed to describe the disease as it appeared; and although it may not be defined in the most explicit terms, I hope a recollection of my inexperience will be a sufficient apology for its imperfections.

On the 16th of December, 1799, it commenced with uncommon violence and malignancy. In four days from the attack, more than thirty of our crew were labouring under its distressing symptoms. On the 20th, from an idea that the sea air might check its progress, the Captain was prevailed upon to go to sea; but in consequence of the increasing malignancy of the disease, we were obliged to return on the 24th, in a very alarming and melancholy situation. On the 25th, a very convenient and spacious building was hired for the reception of the sick, to which between forty and fifty of our crew were removed, myself included.

This house was situated on a small eminence adjacent to the sea; in consequence of which, and the judicious plan upon which it was constructed, there was a free and constant circulation of salutary air through it. The removal of the sick to this building was attended with the happiest effects. The disease, in many instances, from a very malignant aspect, was changed, comparatively speaking, to a form of the mildest kind.

The precursors of this fever were, depression of spirits; inactivity, and inability to perform motion; indigestion and nausea; perverted taste; dry, pale and contracted skin; yawning and sneezing; costiveness, and paleness of urine, &c.

Its attack was announced, in some, by a slight rigor; in others it commenced with only a slight sensation of cold. In some it was ushered in with a complete shivering; whilst, in a few, not the smallest sensation of cold was experienced.

There was a great variety in the state of the pulse in this disease. In some there was a fulness and tension, without quickness or preternatural frequency; whilst in others it was preternaturally frequent and quick, without either fulness or tension.

The intermitting pulse was evident in several cases, which I observed always to indicate a speedy recovery.

A remarkably slow and weak pulse appeared in a few. In one patient it beat but thirty-seven strokes in a minute, twelve hours before death. A dejected countenance, the eyes sunk in their sockets, with dilated pupils, and imperfect vision, coma, with cold clammy sweats, and cold extremities, were the concomitants of this state of the pulse, and commonly denoted the approach of death.

In some it was remarkably weak and frequent a few hours before death. In a few it was almost imperceptible; and in two it was totally so for many hours. In one patient it was full, tense, and preternaturally frequent, but one hour before death.

Hæmorrhages were unfrequent. In two cases grumous blood was discharged from the stomach in excessive quantities; and in one, dissolved blood ran from the mouth and nose in a constant stream. In a few it issued from the gums; and in one it flowed from the puncture in the arm for some hours previous to death. In three or four a bleeding at the nose alone occurred, but its duration was short.

So strongly did this symptom indicate the approaching dissolution of the patient, that I never after entertained an idea of effecting a cure. From a sympathizing disposition, and a desire of affording some consolation to my patient in the last hours of his illness, I often spent an hour or more in endeavouring to dissipate the gloomy apprehensions of his disordered mind. Often, with my fingers applied to the pulse, have I witnessed, with tears in my eyes, the rapid approaches of death, which at last cut the slender thread, and put an end to his miserable existence.

I recollect no instance of hepatic affection, except two or three convalescents, who complained of a dull pain in the right side, when they made use of too much exercise.

During my confinement I was informed of one case of pneumonic affection, which, I believe, was the only one that appeared.

A redness of the eyes, dilated pupils, pain in the head, nausea and vomiting, costiveness, &c. universally attended this fever, and plainly proved the existence of morbid congestion in the brain. The pain of the head was sometimes seated in the temples, sometimes in the back part of the head, but generally in the fore part.

Nausea or vomiting generally commenced with the fever. In common, nothing more than the ordinary contents of the stomach were brought up at first, but always after a few ef-

forts were made, and the undigested aliment was discharged, a large quantity of green or yellow bile was evacuated.

When the disease commenced without a cold fit, the vomiting seldom came on before the third or fourth day, when the matter was generally black and very offensive.

A very distressing sensation of heat was commonly experienced in the stomach, in those cases attended with vomiting. It accompanied the vomiting, in a few, from the beginning; but generally it was not felt before the third day. No person, perhaps, suffered more with it than myself.

Costiveness was a very common symptom. In many the most drastic purges were administered without producing a stool, which could only be effected by the most powerful clysters. After two or three active clysters were given, they became copious. But few spontaneous stools came under my observation. In some they were excited by mild cathartics; and, in a few, a dose of emetic tartar had the happy effect of cleansing the whole alimentary canal. In a considerable number they were highly tinctured with green bile; whilst, in a few, they consisted of nothing more than the natural excrement of the body. In two cases they were black and very fœtid, accompanied with flatulency and pain in the bowels. During the predisposition to the disease, the urine was clear and plentiful; but generally, after the fever commenced, it became high coloured, scanty, and was evacuated with considerable difficulty. In a few instances it appeared to be tinctured with blood. In many it was highly impregnated with bile, which plainly discovered itself in the smell and taste. After standing a few hours in a bucket, it became fœtid, which I imputed to the bile with which it abounded. Though, in some instances, it was evacuated in very small quantities, and with the most excruciating pain, a single case of total suppression never came under my observation. Its scarcity was generally greatest, and the pain which attended its evacuation most severe, at the height of the fever. It assumed the dark colour in one instance.

But few patients were relieved by spontaneous sweats. In many instances the disease terminated with a copious artificial sweat. If the fever were not subdued before the third or fourth day, a sweating could seldom after be excited. One patient sunk under a profuse cold sweat.—They were always yellow.

The tongue, in most cases, was moist at the commencement. It seldom changed its colour before the third or fourth

day, when it became highly tinged with yellow. In the greatest number of those who died it became black. The gums also became black, and the teeth so loose in their sockets as to be easily picked out with the fingers.

No case of apoplexy or syncope came under my observation. Convulsions were common in the last stage of the disease. The disease, in one instance, commenced and terminated with coma. In one it appeared in the form of tetanus, with locked jaw. A distressing hiccup took place in a number. So great was the sensibility in one case, that the slightest application of the finger to any part of the body would excite the most excruciating pain. I witnessed several cases of preternatural excitement.

A delirium was not common. It occurred only in a few, in the last stage of the disorder. Many were remarked for an uncommon acuteness of understanding in the exacerbations of the fever. They would sometimes reason with astonishing force and perspicuity.

The pain in the head, back and eye-balls, was, in general, very distressing. In some the arms and legs suffered equally with the head and back.

A dimness of sight, with dilated pupils, was not uncommon. A great thirst generally attended the exacerbations. The appetite was always impaired while the fever continued.

In two cases the testes were considerably swelled and very painful. In both these the whole surface of the scrotum was excoriated, and covered with an uncommon discharge of matter, not only very offensive to the smell, but highly corroding to the adjacent parts. These were the only instances in which the glandular system appeared to suffer.

Though the skin was in general warm, it was preternaturally cool in a few. The yellow colour seldom appeared before the third day. In common, it was discovered first in the eyes and forehead. In some it appeared only in the eyes; whilst, in a few, it was never noticed in any part of the body.

I shall say nothing respecting the blood, as I had but few opportunities to observe its different appearances.

Eruptions of various kinds appeared. That which was most common, and which struck my attention most, was in every respect similar to musquitoe bites.

I shall be obliged to omit many phenomena which would have been of great importance in the history of this disease, in consequence of neglect and a treacherous memory.

Not only this, but every other part of the history of this malady, will be deficient in consequence of the length of my indisposition, and the reasons I have already assigned.

I shall now proceed to make a few remarks relative to the cure.

When I inform you that but twenty died out of one hundred and thirty who had the disease, it may possibly be thought that it was not so malignant as I have described it.

Certain it is, its mortality was not so great after the sick were removed to the hospital. This I ascribe to the efficacy of a salubrious sea air which circulated freely through that building.

An emetic was the first remedy prescribed, with a view of discharging the bile, with which the stomach abounded in excessive quantities. It was the opinion of the Surgeon, in which I conceive he was mistaken, that this superabundance of bile was the cause of the disorder; that the fever, and every other symptom, was excited by it; that it had been generating some time previous to the attack of the fever; and, unless it was evacuated, there was no possibility of effecting a cure, It was also his opinion that the seat of the disease was in the stomach, and that it was an error to consider it as existing in the sanguiferous system.

If, after one emetic had done operating, there was still a nausea and disposition to vomit, he would administer a second; and although one did in some instances effect a cure, when two were given the consequence was serious. In some convulsions were excited; whilst in others it produced violent spasms of the stomach and bowels, and a vomiting of blood.

A cathartic was the next remedy prescribed by the Surgeon, after the operation of which he generally gave nitre in small doses, and an anodyne at night.

I often urged the propriety of blood-letting, but it was seldom permitted to be tried. In some instances I had the pleasure to witness the happy effects of the loss of a few ounces of blood. So great and immediate was the relief in a few patients, that they fell into a profound sleep while the blood was flowing. More than once have I destroyed the disease by a single bleeding.

Blisters were sometimes very serviceable.

Brandy and laudanum, when applied to the external region of the stomach, had the happy effect of stopping a vomiting of blood in two or three cases.

ARTICLE VI.

Some EXPERIMENTS *and* OBSERVATIONS *on the* MODE *of* OPERATION *of* MERCURY *on the* BODY: *Read before the Academy of Medicine of Philadelphia, November* 19, 1798. *By Dr.* PHILIP S. PHYSICK.

IT has for a long time been a common opinion among physicians, that the different preparations of mercury are effectual in producing salivations, or in curing lues venerea, and some other diseases, only when they have been absorbed and carried into the blood. So confident were they formerly of mercury entering the system, that it was even believed, in some instances, to have been deposited in the bones in the form of quick-silver. This latter opinion has been sufficiently disproved by accurate anatomical investigations; though the former continues still in vogue, and is generally believed.

Several years ago, and not long after my medical studies were commenced, a case occurred, which has since raised some doubts in my mind on this subject, and has led to a further inquiry. A young man, who had contracted a gonorrhœa, took occasionally cathartic pills, composed chiefly of jalap with a very small addition of calomel. After he had taken several doses of these pills, his mouth became suddenly very sore, and a copious spitting was produced. He was greatly alarmed at the idea of a salivation, and reproached me with having given him an unnecessary quantity of mercury. I assured him he had taken but very little of that medicine, and that, as what he had taken must have been purged off, it was very doubtful whether the soreness of his gums, and spitting, were mercurial or not; for I had been taught, that whenever mercury proved cathartic by itself, or was joined with purgative medicines, it would all pass off with the alvine discharge; and that, consequently, there would be little or no reason to apprehend a salivation from it. To ascertain, however, whether the mercury had occasioned the disease in his gums or not, he was desired to keep a guinea in his mouth all day, considering it probable that if the spitting was occasioned by the mercury, the colour of the metal would be changed. I was much pleased next morning to find it unaltered, and my patient was quite contented with the result of the experiment. My own mind, however, was by no means satisfied; not only

because I was at a loss to account for the sore mouth without attributing it to the calomel, but also because it resembled, in every respect, that disease in the mouth which I had several times before seen occasioned by mercury. The experiment with the guinea, therefore, was repeated on two persons who were labouring under salivation from the use of mercurial ointment, and, much to my surprize, the gold was still found unchanged in its appearance.

About a year ago a clean piece of gold was immersed in some blood drawn from a man who had taken a considerable quantity of calomel, and also used mercurial ointment, and in whom salivation was just beginning. It was kept in this blood two days, and frequently stirred, but it still suffered no change in its colour. Next it was immersed in a considerable quantity of his saliva, with the same result. Similar experiments were made with clean pieces of silver and copper, but no change appeared in either of them that could be attributed to mercury, because the same changes of colour or tarnish took place by immersing these metals in the blood and saliva of persons who had not used any mercury.

Being desirous of having some further tests used, the above observations were communicated to Dr. Seybert, who obligingly undertook not only to repeat the experiments with the gold, but also to make several others on the blood and saliva of a patient under similar circumstances with the one last mentioned.

"In the month of November, 1797," says Dr. Seybert, "a piece of polished gold was immersed in the saliva of a patient who was under the operation of mercurial medicines. It remained therein during several days, and suffered no evident change whatever.

"November 26, 1797. A piece of gold was immersed in the serum of the blood from the same person, and was not altered.

"November 27. I made a paste with finely powdered charcoal and some of the above-mentioned serum. A piece of copper was imbedded in said paste, and then placed in an Hessian crucible in the fire. It remained there until the coal became ignited, and was allowed to continue so during ten minutes: it was then removed from the fire, and the copper had suffered no alteration except from being heated.

"A quantity of the same serum was poured into an oil-flask, in the neck of which a piece of polished gold was suspended. The flask was then placed over the fire: the liquor

boiled and evaporated. A spongy mass remained; but the gold suffered no alteration, neither did another piece of the same metal, placed over the mouth of the flask.

" Lime-water did not alter said serum when mixed with it.

" Ammoniac did not alter its appearance.

" Diluted muriatic acid produced a copious white precipitate.

" Diluted nitric acid produced a more copious precipitate than the former, which appeared similar in both instances.

" The muriate of ammoniac produced no change, neither did the muriated barytes.

" The nitrate of silver produced a copious white precipitate.

" The prussiate of pot-ash effected no change.

" The solution of arsenic did not alter it.

" Similar experiments to the above were performed on the serum of the blood obtained from a person not affected with mercury, and the results were the same in both."

The introduction of mercury into the blood-vessels through the absorbents (an hypothesis which appears to have been admitted by physicians without much examination), is at least rendered very improbable by the above experiments.

It may, indeed, be said, that the mercury is combined with the blood in such a peculiar way, that the above means have not been adapted to detect it; but such an objection must be granted to be a very lame one, because it is hypothetical.

There is no fact with which I am acquainted to prove that mercury is even admitted into the absorbents; but if this could be ascertained to be the case, it would by no means be just to conclude that it must pass on through their trunks unchanged, because the absorbents, in common with the stomach, are probably possessed of a digestive power; and I should be much disposed to believe, that if mercury were detected in the absorbents, and not found in the blood-vessels, it would only be a circumstance, in addition to many others, to prove the lymphatics to be possessed of such a power.

It is a fact well ascertained, that the process of vegetation has the power of forming different metallic substances out of air and water; and it appears to me highly probable, that the digestive process of the stomachs and absorbents of animals have the power of decomposing small quantities of them, and reducing them back to their original elements.

On what principles the opinion is founded, that mercury must enter the blood to produce its peculiar effects, is not very evident; for my part, I see no reason why its operation

should not be explained on similar principles to those on which the action of other powerful remedies appears to depend. No one now suspects that opium, tobacco, aq. lauro-cerasi. Peruvian bark, &c. enter the blood-vessels; and yet these substances act extensively and powerfully on the body.

I know that it is very difficult, if not impossible, to explain the peculiar effects of mercury on the system, but I believe that difficulty would not be diminished by supposing it to be mixed with the blood.

Every article of the materia medica produces at first local effects, or stimulates the part to which it is immediately applied; and, in consequence of this local impression, the actions of neighbouring or distant parts are altered sympathetically. I am disposed to believe that mercury acts in this way, whether it be applied to the stomach or the skin.

It is not mercury only that produces similar effects, whether applied to the stomach or skin: opium, strong liquors, Peruvian bark, and cantharides (in one circumstance) have the same quality.

I shall next mention several circumstances which prove that the salivary glands are capable of being stimulated by impressions made on distant parts. Thus we observe,

1. That a copious secretion of saliva is generally excited by the nausea produced by the irritation of an emetic in the stomach.

2. Ideas often increase the action of the salivary glands.*

3. Pregnancy, in some women, occasions a salivation sometimes of several weeks continuance: and,

4. I have observed a copious spitting, with swelled gums, ulcerated cheeks, and loose blackened teeth, in three different persons who had never used any mercury. I have attributed these symptoms to acidity of the stomach; because, by giving a solution of salt of tartar, after trying, without effect, several local applications, they were soon cured.

* Every one is acquainted with the effects of seeing savoury food; but the following case is a striking instance of the influence of the mind in increasing the salivary secretion. In the year 1790, a male patient in St. George's Hospital (London), who was using muriated barytes, took up an idea that his medicine was mercurial. In the course of two days he began to spit, and discharged near a pint of saliva per day for four days; when, to ascertain whether this was purely the effect of his mind, or whether the medicine had any influence, I told him his medicine must be changed, and that I would give him another to check the spitting. The bottle was taken away, but the same dose of muriated barytes given, disguised by a small quantity of spermaceti mixture. The effect was, that the salivation ceased in two days.

ARTICLE VII.

Observations *upon the* Disease *produced by the* Bite *of a* Mad Dog: *Communicated by* James Mease, *M. D. to Dr.* Miller.

THE accounts of cases of the disease arising from the operation of the canine poison, which were published in the last number of the Medical Repository, suggest some observations, which I think it more useful to send you without delay, than to keep until arranged and connected with others in a more systematic form.

The first fact which the excellent case related by Dr. Physick assists in proving, is, *that the size of the wound is no way connected with the time of the attack, nor with the fatality of the disease.* The wound which gave admission to the virus in *York*'s foot was so small, that when questioned about it in my hearing, he said, "Oh, it was nothing—a mere scratch near my toe." Dr. David Ramsay, of Charleston (S. C.) communicated a similar fact to me in May, 1796. The person was bitten fifteen months before the disease appeared, and the wound was so slight, that the circumstance of the bite had entirely escaped the memory of the sufferer and family, and was only brought to their recollection by the mention of it to them.

2. The case of York proves, *that the late or early appearance of the disease is not regulated by the proximity to, or distance of the bitten part from the head.*

As far as I can find, I stood alone for some time in this opinion, which I first published in my Inaugural Dissertation, May, 1792. The contrary opinion is delivered as an axiom by all the systematic writers on the disease I have met with, from Cælius Aurelianus down to Sauvâges. It is even admitted in the report of Dr. Hunter on the disease, to the Society for promoting Medical and Chirurgical Knowledge.* In York's case we find a boy bitten in a part the most remote from the head, attacked in about five weeks; while others, bitten nearer to the head, remained much longer well. Thus J. Groves,† who was bitten in the breast and neck, was not affected until the ninety-sixth day. Johnson,‡ bitten on the

* Trans. of Soc. &c. vol. i.
† Hamilton on Hyd. vol. ii. p. 292.
‡ Med. Facts, vol. ii.

cheek, was attacked in three months. Billass,* bitten in the thumb, enjoyed perfect health until the nineteenth month; and Ryder,† bitten in the wrist, was attacked in eighteen months. If, however, these instances are only deemed exceptions to a general rule, which may nevertheless be well founded, let the reader turn to the second volume of the remarks of Dr. Hamilton on the disease, and he will find a mass of evidence against which there can be no resistance.

3. The case adds one more proof to many others on record, of the *falsity* of another opinion delivered by some systematics; viz. *that the danger of the bite is proportioned to the advanced stage of the animal's disease.* York had been teaching the dog (apparently in perfect health) to fetch and carry for two hours before the cur gave the bite. Similar cases are recorded, where not the smallest indisposition was perceived in a dog before the moment of his inflicting a bite. The virus appears to be no more exalted or active when the animal is near death, and raving, than during the first moments of indisposition. The chance of disease, therefore, from the bite received at any stage, is equal. It is a consolatory circumstance, however, and ought to be generally known, that, fatal as the disease hitherto has been when it came on, yet the proportion of those who are attacked is trifling compared to those who are bitten.

4. Is it fair to adduce the case of York, as an additional proof to the many I formerly quoted of the failure of the depleting plan of cure?

Hitherto bleeding has been generally prescribed in this disease, because Boerhaave pronounced it, "*Summe inflammatorius*," and because, in case of a failure in the attempt to cure, *prudent physicians* have found it much more to their interest to be able to shield themselves under the sanction of the fact that their remedy has failed in the hands of the greatest physicians, than to attempt the cure by a new plan. But in the present case the remedy was prescribed by a physician who is accustomed to view the welfare of a patient as the only object of consideration; and if ever a case of the disease in question occurred, in which the plan was justified by the mode of attack, and by the symptoms, that of *York* was one. The disease made its attack in the form of fever: the pulse, in particular, was "full, hard, and preternaturally frequent, and

* Phil. Trans. 1737.
† Lond. Med. Journal, vol. viii.

the skin hot and dry." On the afternoon of the third day, when I saw him, his tongue was white and furred, his pulse beat 80 in a minute by my watch, and was tense and full; and yet the blood which he lost had no effect in diminishing the violence of the symptoms. He lost sixty-two ounces, at four bleedings, in the course of twenty-four hours.

The slight appearances of redness, discovered upon dissection, in the trachea, and at the great curvature of the stomach near the pylorus, permit no deduction as to the theory of the disease. I have elsewhere noticed this appearance, which is merely *erysipelatous;* and I accounted for it, in part, by referring it to the irregular determination of the blood throughout the body, and to the *irritation* of the nerves of the part, which, by being communicated to the arteries, may increase the rapidity of their contractions, and create the superficial redness taken for a true active inflammation.

This irritation I supposed to result from the action of the virus generally upon the nerves, and particularly upon those of the stomach; but I am now disposed to ascribe its increase to the causes hinted at by Dr. Physick, viz. the "constant spitting and excessive thirst," and to answer in the affirmative of the question he proposes, whether these causes "do not sufficiently account for the slight inflammation observed in the stomach on dissection." My reasons are as follow:

1. "We know," says Dr. Physick, "that in animals starved to death the stomach is found much inflamed, and it must be remembered that want of drink is far more intolerable than want of food."

2. Dr. Physick informs us that he was distressed with a burning sensation in his stomach, in consequence of spitting out his saliva, while in attendance at the City Hospital, during the epidemic of 1798; and adds, that his colleague, Dr. Cooper, experienced the same sensation, the cause of which was ascertained beyond a doubt, by several experiments. Now, in the disease in question, a constant rejection of saliva is a more characteristic symptom than the dread of water, and starvation almost literally occurs during the short continuance of the sufferer's existence; for the action of swallowing is so distressing, and his feelings so alive to every source of irritation, that he seldom takes either liquid or solid during the violence of the complaint.

3. The following fact was lately communicated to me by a respectable physician of this city. A lady was affected by swelled tonsils to such a degree as to render the operation

of extirpation necessary. The inflammation and swelling which ensued almost entirely suspended the power of swallowing, and the saliva was constantly discharged at the mouth. On inquiry being made as to the seat of the pain expressed in her looks and by her actions, she pointed to her stomach; and, after she could speak, she declared, that during the continuance of the inability to swallow, her pain and distress arose chiefly from the burning sensation in her stomach.

4. Mr. A. Cooper* says he found the stomachs of several mad dogs inflamed after death; and we know that the discharge of saliva by them during life is very great, and that, when mad, they seldom eat or drink. I suppose that the gastric juice not being diluted as usual by the saliva, and the stomach having no food to sheathe it from the action of that powerful liquor, feels the effect of it in the burning sensation mentioned.

Bleeding, it appears, was used in the case of York to a degree which many will think very liberal, and fully adequate to the cure of most, if not all, common inflammatory diseases. But its respectable advocate will probably say, that the delay of twenty-four hours, which took place before any blood was taken away, permitted the disease to gain strength, which the subsequent attempts to cure could not reduce; the stimulus of the canine virus upon the system being so great as to render an early loss of from *two* to *three* hundred ounces necessary to cure the disease. Those, therefore, who adopt the theory of the inflammatory nature of the complaint, will do well to attend to the important injunction of *early* and *copious bleeding*.

Since the publication of my late pamphlet upon the disease, I have met with some additional authorities in favour of the practice of exciting a strangury, which I recommend as a cure. In a paper by M. Andry, in the first volume of the Memoirs of the Academy of Medicine of Paris, several well authenticated cases are related of the efficacy of cantharides, and of the species of Scarabæi called in France *Hanneton*,† and *Vers de Mais*,‡ even when given after the disease appeared to be far advanced. In some, it was remarked, a discharge of bloody urine followed the exhibition of these remedies. But this circumstance, though alarming to the pa-

* Med. Records and Researches.

† Scarabæus Vulg. Rufus. (Lin.)

‡ Proscarabæus. (Lin.) Bomaire Dict. Hist. Natur.

tient and friends, is not dangerous when brought on in this way, and ought not to prevent our using the remedy. We frequently see a similar discharge follow the application of several blisters at the same time, without any bad consequences. Demulcent drinks and the warm bath will soon give relief. The admirable case related by Dr. Brown, of Kentucky,* of the cure of tetanus by the exhibition of the tincture of cantharides, proves the little danger to be apprehended from the occurrence mentioned.

In the letter of Dr. R. Pearson, inserted at page 77 of the present volume of the Repository, Dr. Rush's idea of the complaint is evidently mistated, when it is said, that "the canine rabies might not unaptly be denominated *typhus hydrophobicus.*" By terming the disease produced by a mad dog's bite a "malignant fever," Dr. Rush does not mean typhus, but *synochus* of Dr. Cullen; that is, a fever first inflammatory, and afterwards putrid (as commonly termed).† The conclusion, therefore, of Dr. Pearson, that venesection must be rejected, is erroneous, because it is founded upon a false assumption, a misnomer. Agreeably to the ideas entertained by Dr. Rush of a malignant fever, and which have a reference to the inflammatory malignant fevers that prevail in the summer and autumn in the United States, the debilitating treatment he advises is perfectly consistent. I agree, however, with Dr. Pearson in rejecting the practice.

Dr. Pearson prefers caustics to the arms and thighs to blisters, because "they produce a more powerful and more permanent action on the surface of the body, and, at the same time, are unattended by the peculiarly distressing irritation on the urinary passages which the cantharides occasion—*an irritation carefully to be avoided in this disorder.*

If caustics would have the desirable effect of relieving the throat, I also would prefer them to blisters; but I much doubt their superiority in this respect; and as to the danger of a strangury from the use of the latter, this, so far from being a reason for omitting the remedy, is the very effect I wish to produce: hence I would apply blisters to the bitten part after

* See Med. Repository, vol. iv. p. 337.

† Dr. Rush neither admits the existence of putridity in the blood, nor uses the term putrid fever, and substitutes in its room the "gangrenous state of fever;" for, says he, "what appear to some physicians to be signs of putrefaction, are nothing but the issue of a violent inflammation left in the hands of Nature, or accelerated by stimulating medicines."

[*Works*, vol. iv. p. 158.

enlarging it and filling it with cantharides, and would follow Dr. Brown's judicious practice, successfully pursued in tetanus, and give the tinct. cantharid. in the dose of ten or fifteen drops every hour, until not only a strangury was produced, but also until some irritation appeared in the stomach and bowels. In the case related by Dr. Borrowe, page 73 of this volume, evident good effects, though of short duration, succeeded the application of blisters.

Of caustics, however, I think well, if applied to the bitten part, and even after the disease has appeared. When a locked jaw proceeds from a wound in the foot or hand by a rusty nail, or other pointed instrument, we see the most happy effects from the practice of raising an irritation in the parts by means of salt, hot turpentine, or Spanish flies; and from the close analogy subsisting between the two diseases, I entertain not the least doubt as to the relief which the throat would derive from a similar irritation raised in the part bitten by a mad dog: from the quick and powerful action of caustics, I think them highly worthy of use when expedition is required.

The case treated by Dr. Borrowe does not militate against the efficacy of the excellent plan of ablution as a preventive, though early instituted. It would have been well to have continued it for a longer time, and the wound ought to have been previously enlarged to permit the penetration of the water to the sinuosities made by the dog's tooth, as recommended by Dr. Haygarth. A disease which appears in all the intermediate periods between *ten days* and *four years* (as I shall presently show) must render an internal preventive remedy useless, for it is clear that the system could not be kept under the impression of any remedy during that long period, to a degree sufficient to counteract the effect of the canine poison. Numerous records of cases, beside that by Dr. Borrowe, prove that the use of mercury internally, even to salivation, and of other remedies, do no good as preventives. We have only to depend upon an early excision of the part if practicable, or otherwise upon washing out the virus by *long continued streams of water from a tea-kettle, and putting an issue in the part.* The tincture of cantharides could not be said to have had a fair trial. It was given to the extent of thirty drops every hour, but not until the fourth day of the boy's illness. No sensible effect was produced, though the medicine was continued through the day. A more early exhibition would probably have enabled us to determine whether

that remedy would not succeed as well in the disease produced by the bite of a mad animal as in tetanus.

Dr. Hamilton has fixed upon the tenth day as the shortest period at which the disease has ever appeared, and nineteen months as the longest interval that has hitherto been known to take place between the bite and the attack. But I have lately been informed of a case in which this destructive virus lay dormant four years and three months before it began to operate. I wrote to the boy's father, Mr. Isaac Pyle, of Bethel township, Delaware County, Pennsylvania, to request the particulars, and was favoured with the following account:

On the 14th of the seventh month (July), 1797, Mr. Pyle's son, about fourteen years of age, was sent for the cattle, and, while crossing a fence, a cat seized his great toe; and he was not able to disengage her until after descending from the fence, and placing his other foot upon her, when he drew the toe out of the mouth of the animal, but not without having it completely divided by her teeth. Being armed with a club, the youth killed the cat. Upon a supposition that the cat was mad, the nostrum of the Goodman family of this city was taken, but, as will appear, with as little success as attended the host of other absurd compositions to which lives in all countries have been sacrificed. No symptoms of indisposition appeared until Saturday, the 19th day of the eleventh month (Nov.), 1800. He was then seized with a pain in his hip, head and back, and appeared dull and heavy. Occasionally he would fall asleep in his chair; and though, while in this state, his respiration was so loud as to be heard out of doors, yet, when awakened, he could scarce be brought to believe that he had been asleep. He was extremely irritable, and, when taken hold of, would start and cry out as if frightened. His mouth was filled with saliva. He had a strong aversion to drink, and, when it was offered to him, would appear as if about to be attacked with convulsions. In this state he continued until the following Sunday evening, when he became occasionally delirious, had a wild look, talked much, and declared his belief that he should not long survive. The following day he appeared more calm; but on Tuesday, about noon, he fixed his eyes to the ceiling, and appeared as if he beheld something which greatly alarmed him, and which he could not be prevented from viewing. He continued in this way until the next morning, *when, after twice discharging matter resembling strong coffee,* he expired.

The above case, which I believe to have been produced by

the operation of the canine virus, affords the longest interval between the bite and death of the person bitten, of any well authenticated instance on record. It will long be a problem of difficult solution to explain the reason of the very irregular operation of this subtle and powerful poison, and to determine upon what principle it happens that it remains dormant in the part of its original insertion during four years; or, if the virus be absorbed, that it should so long circulate with the general mass, and not be excited into action by any of the various causes which, in constitutions apparently similar, occurred and operated in ten days after the bite. It is much to be wished that the practitioners of medicine in the United States would turn their attention to the consideration of this truly awful disease, and make up their minds as to the mode of treatment they are determined to pursue; and, when a case occurs, to give it a fair trial, avoiding, if possible, the shackles and feeble practice resulting from consultations. In order to secure a prompt and speedy application of remedies, it would be well for the physician of the person who may receive the bite to watch carefully the first appearance of indisposition, and instantly to apply his method of cure, for the disease runs its course so rapidly that not an hour ought to be lost. I wish much to see the cantharides tried; and, surely, in a disease hitherto almost universally fatal, we are justified in attempting a cure by a plan in favour of which analogy, authority, and the well known laws of the system, plead so powerfully. Let the case be fairly and concisely stated, whether successfully treated or the contrary. In this way, and in this way only, shall we arrive at some certain mode of cure. Those who may finally be the happy instruments of disarming the awful disease of its terrors, will justly merit the thanks of their own country, and of the world in general; yet others who follow the example of the great father of medicine, and, by a narration of their failure in a cure, teach us what road to avoid, will also come in for a large portion of the honourable reward.

ARTICLE VIII.

Some Remarks *on the* Importance *of the* Stomach *as a* Centre *of* Association, *a* Seat *of* Morbid Derangement, *and a* Medium *of the* Operation *of* Remedies *in* Malignant Diseases.

By Edward Miller, *M. D.*

In the second volume of this work, page 409, first edit. I undertook to lay before the public some "*Cursory Observations on that Form of Pestilence called Yellow Fever.*" In an attempt to pursue the analogy between febrile miasmata and poisons, I endeavoured to prove that the former are commonly received into the stomach by the swallowing of saliva in which they had been lodged, and that by coming in contact with its internal surface, they produce the affections of that organ and of the upper intestines, which are frequently indicated by the symptoms of yellow fever, and afterwards, in fatal cases, laid open to view by dissection.

The phenomena of hydrophobia, and particularly those of two cases which occurred in this city, and are related at p. 73 and 75 of this volume, have induced a change of my opinion as to the mode of operation of febrile miasmata on the stomach, and a conviction of the necessity of referring many such appearances of derangement in that organ to the influence of a law of animal nature, which seems to bear a very interesting relation to the theory, prevention and treatment of malignant fevers. To correct the mistake, to state what now appears to be a more accurate view of the subject, and to point out some of the important and practical consequences which are supposed to result from this opinion, are the objects of this paper.

The cases of hydrophobia just referred to, presented complete examples of malignant fever. The mode of accession, the febrile symptoms, the progressive extension of disease from a few to many parts of the system, till at length all the important organs were deeply involved, the gradual and uninterrupted exhaustion of the principle of life, and the period of the fatal termination, all corresponded exactly to this character. The vomiting of black matter* in one instance, and the yel-

* I am aware that this symptom may be ascribed, at the first view, to the large and frequent doses of tincture of cantharides prescribed in that case. The short space of time, however, in which the black vomiting

lowness of the skin in the other, after death, were sufficient to impress the minds of all who had been accustomed to see that form of malignant disease which has so often prevailed in the cities of the United States for the last ten years.

The analogies between hydrophobia and malignant fever have been so ably exhibited by Dr. Rush,* that it is unnecessary for the present purpose further to prosecute that subject. Of the various points of similarity between them, which he endeavours to establish by a recurrence to facts, none seems to be more important and convincing than the condition of the stomach and other portions of the alimentary canal, as well as of several other viscera, when laid open to inspection by the dissection of bodies dead of these diseases. If the poison of a mad dog producing hydrophobia were to gain admittance into the body through the alimentary canal, as is supposed, with great probability, in respect of febrile miasmata, the similar disorganization of that canal, and especially of the stomach and duodenum, to what is discovered by dissection, after cases of malignant fever, would not so pointedly demand attention nor offer instruction. Every person would explain the

came on after the first doses, and the total absence of all signs of the more usual effects of that agent on the system, compel me to reject the opinion.

But admitting, for argument's sake, that this instance of black vomiting, and of disorganization of the stomach, was the consequence of using the remedy in question; it is well known that the vomiting of similar matter, as well as unequivocal appearances of inflammation and derangement of the stomach after death, are frequently observed in cases of hydrophobia.

Mr. John Hunter informs us, that in the examination of the bodies of those who have died of hydrophobia, "an appearance has, in general, been seen on the inner coats of the stomach, near the cardia, similar to what is found in the bodies of persons who have had slight inflammation, that is, a greater number of red vessels with small streaks of red blood. In some instances there has been an increased vascularity of the *pia mater*, or slight watery effusion on the surface of the brain. In some dogs that died of the disease, the appearances upon the inside of the stomach were similar to what have been already described; but there was no unusual fulness discovered in the vessels of the brain, or its membranes."—*Transactions of the Society for the Improvement of Medical and Chirurgical Knowledge*, vol. i. page 311.

Dr. Baillie observes (Morbid Anatomy, p. 68), that "in opening the bodies of persons who have died from hydrophobia, the inner membrane of the stomach is frequently found inflamed at the cardia and its great end."

Authorities in proof of this condition of the stomach, found after death from hydrophobia, might, if it were necessary, be multiplied to any extent. Many likewise might be adduced of the discharge of a dark coloured matter, by vomiting, towards the close of that disease, and where nothing had been taken which was calculated to induce inflammation and its consequences.

* Medical Inquiries and Observations, vol. v. p. 211.

appearances by referring them to the primary operation of a poison coming in contact with this irritable surface. But when we find effects so exactly similar arising from different kinds of noxious matter, conveyed into the system by different passages, one of which is known to be often at a great distance from the parts which exhibit this morbid derangement after death; will it not follow that such parts possess, in an extraordinary degree, the property of attracting and fixing disease in themselves, with the effect of diffusing it afterwards, as will be presently seen, to other parts of the body?

This wonderful property is possessed by the stomach, and some other portions of the alimentary canal, in a degree much beyond the other parts of the body. The importance of the stomach to animal life may be inferred from its being much more universally found in the structure of animals than the brain, heart and lungs, and from the deprivation of it being much more universally and speedily fatal than that of any or all of those vital viscera. In a state of health, the functions of the stomach, as the principal organ of assimilation, will give it a high rank among the parts of the system which support life. But it is in diseases that its principal powers and relations are unfolded to view. In fevers it is probably, in most instances, the first part affected, as it commonly affords the first notices of the approaching mischief. From its susceptibility of morbid action by noxious powers applied immediately to its surface, or to distant parts of the body with which it maintains sympathetic connection, it becomes not only the introducer of such action to the vital organs, but a centre of association, and an index of the most interesting circumstances concerning the accession, progress, remission, crisis and cure of diseases. The extreme mobility of this viscus would be more generally felt if it were not for that unconsciousness of irritations in it which nature has ordained. Even mustard, pepper, salt, and other acrid substances, taken into the stomach, produce no sensation except a pleasant warmth, unless the large quantity of them lead to sickness and vomiting.

No part of the system possesses so wide a range of sympathy as the stomach. The phenomena of diseases demonstrate every day its connection with the heart and arteries, the brain, the lungs, the skin, the kidneys, the uterus, &c. The due understanding and recollection of these sympathies is not only of great importance in detecting the seats, causes and nature of diseases, but quite as much so in directing the means of cure.

In consequence of this centrality of association and sympathy, the stomach is subjected to peculiar degrees of injury and derangement by diseases. It may be safely affirmed, that no part of the body is so liable to disorganization by malignant fevers as the alimentary canal, and especially the stomach and duodenum. Morbid dissections so generally afford proof of this, that it would be improper to detain the reader by a recital of particulars.

Such considerations as these, in addition to a great many others, seem fully to support the doctrine that fever is principally a disease of association, and that the sympathetic theory of it is better adapted than any hitherto known, to explain the various phenomena, and to point out the most appropriate and efficacious modes of treatment. It affords strong confirmation of this doctrine, that the stomach, the most associable part of the system, is the first and principal sufferer from the noxious causes which produce fevers; and that afterwards, in succession, the organs possessing the closest sympathetic relation to the stomach, such as the heart and arteries, the brain, the lungs, the skin, &c. are, precisely in the order of their sympathy, the most exposed to be involved in this morbid connection.

The mistake referred to above, in my paper concerning yellow fever, consisted in adopting the opinion that the gastric affection in that disease ought to be attributed to the primary and immediate action of the febrile poison, swallowed with the saliva, upon the inner surface of the stomach and duodenum. This was undoubtedly a hasty and incorrect view of the subject. The phenomena of hydrophobia, one of the most exquisite and deadly forms of malignant fever, afford ample means of correction. In this disease, the virus received on any part of the external surface of the body, at the most distant point of the upper or lower extremities, after lying dormant awhile, like the miasmata of fevers, though generally for a longer time, excites the stomach into violent morbid action, and then, successively, all the important and vital parts of the system. The manner and degree in which this morbid action disorganizes the texture of the stomach, and occasionally of the brain and other organs, may be learned from the dissection of bodies which have died of hydrophobia, as completely as in cases of other diseases commonly called malignant fevers.

So far as hydrophobia from canine poison may be conceived to be of the nature of malignant fever, the distinction

between the consequences of the primary and secondary modes of affecting the stomach by febrile poisons is either weakened, or falls entirely to the ground. Dr. Darwin, whose theory of fever will remain an everlasting monument of his penetration and the comprehensiveness of his views, relies on that distinction to explain the difference between the mild and confluent small-pox. Thus he supposes, "that in the distinct small-pox the stomach is affected secondarily by sympathy with the infected tonsils or inoculated arm; but that in the confluent small-pox the stomach is affected primarily, as well as the tonsils, by contagious matter mixed with the saliva and swallowed." With all possible deference for such authority, it seems to be difficult to admit this doctrine without many exceptions. There can be no doubt that the inoculated small-pox sometimes proves to be confluent, where no suspicion could exist of contagious matter being admitted into the stomach, and primarily or immediately affecting that organ. Would not Dr. Darwin have been nearer the truth if he had contended that the force of morbid action, which is sympathetically conveyed from the inoculated part to the stomach, and thence extended, by association, to other parts of the system, may, according to constitutional and other circumstances, be sufficiently diversified to produce all the varieties of the distinct and confluent disease?

The phenomena of hydrophobia from canine poison, of the diseases produced by the bites of certain serpents, and of confluent small-pox when it happens to be the consequence of inoculation (all which may be regarded as so many instances of malignant fever), serve thus to show, in a convincing light, the wonderful mobility and associability of the stomach, as well as of the other vital organs with which it is especially connected by sympathy, and thereby to lay a broad foundation for the sympathetic theory of fever.

The doctrine of fever, therefore, which appears to be most consistent with the phenomena, so far as they hitherto have been observed, is this:—Certain noxious powers, called miasmata, contagions and poisons, find admittance into the system through the mouth and nose, or the pores of the skin, or they are inserted by the bite of a rabid or venomous animal. Whether miasmata and contagions, entering by the mouth, exert their action chiefly on the lungs or stomach, cannot yet be certainly decided. It is not improbable that differences in the ensuing disease may often arise from the various degrees of susceptibility in the several organs which give reception to the noxi-

ous matter. But whatever be the mode or place of entrance, the noxious matter, after a longer or shorter time, excites the system to a state of action which is morbid both in kind and degree. The stomach, the most moveable and associable of all the organs of the animal body, is the first to experience this excitement in itself—the most adapted, from its extraordinary powers of sympathy, to extend it to other viscera—and the most liable to sustain the burthen of the disease, and to undergo the most fatal disorganization. To the heart and arteries, to the brain, to the lungs, to the skin, and occasionally to many other important parts of the system, is this morbid excitement communicated by means of the associative influence of the stomach. Hence all the variety of congestion, inflammation, effusion, engorgement, gangrene, and other modes of derangement which dissection exhibits in the stomach, intestines, brain, lungs, and other viscera of such as die of malignant fevers.

If this view of the nature of febrile diseases be just, it will serve to direct the attention of the physician, in an especial manner, to certain objects respecting the prevention and treatment of them, which cannot be too studiously regarded.

Admitting that morbid action in febrile diseases is at first the result of a poison locally applied; that this action begins in certain organs, often primarily and chiefly in the stomach, not so much on account of the local reception of the poison there, as because that viscus possesses an extraordinary portion of susceptibility of excitement; that this action, so implanted in the stomach, the centre of association and sympathy, is gradually extended to other viscera with which it has principal sympathetic relations, such as the heart, brain, lungs, &c. that this action must necessarily, in most cases, commence with a nascent feeble existence, and only by degrees acquire growth, strength and stability; that when once the force of habit is joined to the original violence with which this action began, the means of subduing it will become every hour more precarious and difficult; and, finally, that this action of organs so tender and vital, if allowed to proceed, will often, in a few days, render the system unfit to sustain life, and produce those appearances of disorganization which dissection exhibits after death;—it follows, from a due consideration of these circumstances, that the first object of the physician should be to arrest this diseased action in the earliest hours of its formation, before a more extended operation, time and habit, shall have fixed its possession of the system, and that he should regard all subsequent attempts as comparatively feeble and uncertain.

Although it is not my design to deliver any general account of the treatment of febrile diseases, it will not be improper to glance at some of the remedies whose application depends upon the principles which I have attempted to explain. In this view of the subject, the most direct methods of arresting febrile action are, 1st. To excite a new action subversive of the existing one in the organ originally and principally affected, and in such as are associated with it; and, 2dly. To divert morbid action from an important or vital part, by exciting a sufficient degree of it in some other part less essential to life.

As an example of the first class, it is proper to mention the efficacy of emetics at the commencement of febrile diseases, the use of which is sanctioned by immemorial experience. The evacuation they procure, though often confessedly important, constitutes but a small proportion of the advantage which is found to result. Sydenham perceived this effect with his usual sagacity, without thoroughly understanding the cause. "When I have happened," says he, "sometimes carefully to examine the matter thrown up by vomit, and found it neither considerable in bulk, nor of any remarkable bad quality, I have been surprized how it should happen that the patient has been so much relieved thereby; for as soon as the operation was over, the severe symptoms, viz. the nausea, anxiety, restlessness, deep sighing, blackness of the tongue, &c. usually abated and went off, so as to leave the remainder of the disease tolerable."* His annotator, Wallis, properly remarks on this passage, that Sydenham "was not aware of the sympathetic affections which take place in the constitution, nor knew that an extremely small portion of morbid matter could produce effects so sudden and surprizing, from local action, so as to derange the whole system." It will be apparent to every body, that this morbid action in the stomach, whether primarily or sympathetically excited, while yet only beginning, must be comparatively unsettled and undetermined in its operation; and that this offers the golden opportunity, perhaps never to return, of creating a different and more healthy action by means of emetics, and thereby of rescuing the patient from the danger which awaits him. And at the same time it will be equally apparent, that if emetics be exhibited after certain degrees of morbid excitement shall have been actually formed and confirmed in the stomach, that they will not only be entirely incompetent to dislodge the disease, but will aid and hasten that disorganizing process which renders the system incapable of life.

* Works, vol. i. p. 34 of Wallis's edition.

Sudorifics may be properly taken as an example of the remedies which operate by diverting morbid action from an important and vital to a less important part. It has been often supposed that they produce their beneficial effects by causing the discharge of certain noxious fluids, which, being retained in the system, would have caused a continuance of the febrile commotion. This opinion is opposed by a number of difficulties, which it seems impossible to remove or surmount. On the contrary, the referring of the efficacy of sudorifics to a revulsion of excitement from internal organs to the skin, is conformable to known laws of the animal economy, and supported by facts which fall under daily observation.

The plan of curing diseases by transfer or revulsion of excitement from one part of the system, and fixing it in another, includes a great proportion of our most powerful remedies, and opens a wide field of future discovery and improvement. The effects of mercury in producing ptyalism—of blisters in inflaming and vesicating the skin, and exciting a strangury—of sinapisms, other rubefacients, and of many other articles operating on similar principles, afford examples of this revulsion of excitement. Though it is not requisite that these remedies should be always employed, like emetics, in the forming stage of the disease, it is certainly expedient to bring many of them early into use. This is particularly the case with mercury. According to the principles of association, febrile action will be more easily subdued in its earlier than more advanced stages: hence the mercurial disease will be efficacious in destroying the original one in proportion to the expedition with which it is excited. It is probable, likewise, that the mercurial action will be more readily introduced in the beginning of the disease, when morbid sympathies are few, and feebly catenated, than at a later period, when all the important viscera are labouring under excess of stimulus, and when time and habit have confirmed the strength of the noxious association. Some degree of this reasoning will, doubtless, be applicable to all the articles which belong to this head. In the case now under consideration, the causes of diseases, and the remedies for them, operate on the system upon the same principle. It is by an excessive concentration of excitement in certain organs, and by robbing others of their due share, that such noxious powers induce disease. By pursuing an analogous course, and soliciting excitement back again from the diseased parts, in order to fix it in others less essential to life, the physician (differing chiefly from the morbid

cause in the parts to which he applies the stimulating agent) imitates the procedure of those noxious principles which are most inimical to life.

The doctrine of the leading agency of the stomach in the establishment and extension of the morbid motions called febrile, satisfactorily explains the effects of emotions of the mind, and especially of terror, in bringing on diseases, and imparting to them a malignant character. Whatever weakens the stomach will expose it to the attack of febrile poison. No part of the body exhibits more intimate connection with the mind than that organ. No other part has its functions so immediately affected by mental emotions, as is often observed in the sudden loss of appetite and suspension of digestion by the arrival of joyful or afflicting intelligence. The consequences of this close connection often become pernicious in the seasons of mortal epidemics. Every individual, at such times, must be presumed to be more or less under the influence of the reigning noxious power. Terror is apt to start up and assail the mind from trifling as well as substantial causes of apprehension. The stomach being, as has been seen, the chief recipient and propagator of morbid action, and this morbid action being most likely to intrude and fix itself when that viscus, from any cause, is deprived of its accustomed tone; it clearly results that terror may operate in seasons of malignant epidemics as a powerful and destructive exciting cause. Experience and observation confirm the opinion suggested by reasoning. It is often popularly remarked, that such as are most fearful of malignant diseases are most apt to be attacked by them. There can be no doubt that this opinion is founded in fact. Many of the vague and mistaken accounts of the propagation of malignant diseases by contagion, admit of an easy explanation on this ground. A system, impregnated with the prevailing virus, but capable of sustaining it, without injury, so long as the equilibrium of excitement can be exactly preserved in the several parts of the body, may be supposed to be suddenly struck with terror at the sight of some frightful spectacle, or at the recital of some alarming story. What will be the consequence? The well-adjusted balance of excitement is immediately lost; the stomach, deprived of its tone by mental agitation, is left a prey to the insidious destroyer which had been long lying in wait for such an opportunity of intruding. This principle will go far to explain many pretended facts concerning the contagiousness of Asiatic plague and the yellow fever. It is asserted that contact

is the surest mode of communicating the contagion of the plague. It may be said, with equal truth, that contact is the surest mode of exciting terror in the person exposed to that kind of intercourse. If the apprehension of contagion floating in the atmosphere, and casually applied to the bodies of men, be a source of alarm, what must be the consternation of such as believe themselves to receive immediately from the persons of the sick the undiluted infection they so much dread? It is well known that persons who have imbibed the poison of pestilential epidemics often escape injury, until exposure to cold or fatigue, the effects of intemperance, indigestion, &c. coming in aid of that poison, suddenly induce the disease. There is good reason to rank terror among the most potent of such occasional causes. Among an ignorant and superstitious people, the danger of actual contact will naturally be much more highly rated than that of any species of poisonous particles diffused in the air. This impression will be strengthened by the recollection of several diseases communicable by contact, but not by effluvia. And it is probable that a mortal epidemic, by filling the minds of the weak with frightful impressions, especially when these impressions are heightened by an accidental contact of the sick, is rendered much more destructive to the community through the associative operation of fear, which thus, under the mask of contagion, exerts a fatal influence on the system, through the medium of the stomach. All the resignation that fatalism can boast, in Mahometan countries, is insufficient to shield the mind, and the groupe of vital organs connected with it by sympathy, from the ravages of terror and despair.

The noxiousness of terror seems to admit of illustration from the effects of intemperance in debilitating the stomach, and thereby inviting the attack of febrile action. The observation is familiar to every person, that the invasion of malignant diseases is more frequent and violent after a fit of drunkenness. That the stomach is, in this case, the first and principal sufferer, will not be denied. But the condition of this organ is not rendered much more unfit for the performance of its functions by a debauch than by the overwhelming operation of terror.

The use of mild corroborant remedies, during the prevalence of malignant epidemics, for the purpose of securing the system against the approach of febrile action, by supporting the powers of the stomach, is strongly enjoined by the view which is here presented of the functions and irritability of that

organ. The efficacy of such remedies is also established on the ground of experience. The daily use of a small quantity of Peruvian bark to fortify the stomach, and, through the medium of that, the whole system, against the fevers of tropical regions, has preserved multitudes from the attack which otherwise awaited them. It is believed that no instance of the failure of it, if properly taken and continued, stands upon record.

The sympathetic theory of fever affords the easiest solution of the problem of its spontaneous cure. The healthy action and associations of the several organs of the body are more natural, powerful and durable, than such as are morbid, and, of consequence, have an incessant tendency to recur, and regain their force whenever the excitement of the disease proves too feeble to disorganize or extinguish the life of the affected parts.

The same theory satisfactorily explains the cure of diseases by such a variety of different, and often opposite remedies. If evacuants be employed, the sympathetic relations of all the important organs to one another will frequently, in milder cases, render it almost a matter of indifference whether this or the other mode of evacuation shall have been preferred. And it is equally plain, that to excite a new action in any part, subversive of the existing morbid one, or to produce a revulsion of excitement from an organ of importance to another less essential to life, an hundred different remedies may be used without leading to any material variation in the result. Still, however, it should be always remembered, that there is a highest grade in the appropriateness of the selection, as well as in the efficacy of remedies, which the enlightened physician will incessantly endeavour to approach.

An attention to the condition of the stomach has been always known to physicians as a leading part of their duty in the treatment of malignant diseases. The reason and necessity of this will more fully appear if it be granted, as has been attempted to be shown, that this organ, from its peculiar and unequalled susceptibility, is the chief introducer and propagator of febrile action, the most apt to become the subject of its disorganizing violence, and, as a medium of the operation of remedies, its most powerful counter-agent and destroyer. And hence it will be obvious that the proper management of this noble organ, and of its band of noble associates in sympathy, is of primary, essential, and decisive importance, in the prevention and treatment of malignant fevers.

REVIEW.

ART. I. *The great Error of American Agriculture exposed; and Hints for Improvement suggested. By* Thomas Moore. Foolscap 8vo. pp. 72. *Baltimore.* Bonsal & Niles. 1801.

IF our information is correct, the author of this agricultural essay is the President of the Farmer's Society, established at Sandy-Spring, in Montgomery County, in the State of Maryland. In that neighbourhood the inhabitants have gratified their desire of communicating ideas upon this complicated and experimental art, by embodying for the purpose. And were it allowable to form an opinion of the Society from this performance of the President, we should entertain sentiments very favourable to it and its members.

The cultivation of the earth may be considered as the most useful of the arts. It furnishes those productions which are immediately necessary to the sustenance of man. And the people who steadily devote themselves to the occupations of agriculture are justly deemed more independent, more virtuous, and more happy, than any other denomination of men. In America, particularly, agriculture is the foundation of productive industry, and the bulwark of moral habits. Throughout the United States, the land is distributed among a great number of proprietors: these proprietors have the entire ownership and disposal of their freeholds: the ecclesiastical incumbrances of tythes, and the feudal impositions of rents and services, are unknown: and the improvements of the farmer or planter accrue to themselves and their families, inheritable as a clear estate, or transferable at their option to any purchaser. Where the soil is parcelled out among millions of free citizens, each has more at stake in the community, has greater importance and higher responsibility, and as he values his actual enjoyment and future prospects of happiness, will become convinced that the self-government he exercises ought to be founded on wisdom and virtue. From these causes may be deduced that independent spirit, that honest demeanour, that unsuspicious frankness, and that unaffected patriotism, which distinguish the sons of agriculture.

How worthy, then, of consideration is this noble art!

How laudable the efforts of those who detect its errors or introduce improvements!—How particularly commendable are those Americans who labour and make experiments for the instruction of their fellow citizens! Next to the invention of the plough, that most useful of all instruments, the *proper use of it in tillage* presents itself to the mind. Mr. Moore, the writer of the essay before us, is of opinion that the mismanagement or ill-direction of the plough is the capital misfortune of American husbandry. For want of sufficient magnitude and strength of construction, it is not capable of penetrating the earth to a sufficient depth; and the furrows, being so superficially formed by the share, give little opportunity for the roots of plants to penetrate them and be nourished. He considers that the American farmers have too implicitly followed the method of European writers, without making the requisite departure from their directions on account of the difference of latitude, soil and exposure. And he professes an enlightened and rational zeal for making original experiments in our own land, whereby the interests of practical farming may be most substantially promoted among us.

To enable our readers the better to comprehend Mr. M.'s design, and the manner in which he has executed it, we have thought proper to quote his own words (p. 10), where, after some remarks on the climate and soil of the United States, he thus proceeds:

"These things being premised, I shall endeavour to enumerate some of the evils inseparably attached to that great error in American agriculture, *shallow ploughing;* beginning with new lands, or those just cleared of wood.

"What is the language of our farmers and planters on these occasions? 'Our soil is not more than two or three inches deep; we must plough *shallow*, otherwise we shall turn up too great a portion of *dead earth*, and ruin our crops.' They also say, 'We must plant *wide*, otherwise a drought will cause our corn to fire.'* And for these supposed weighty reasons, those two practices are almost universally adopted on new lands; to wit, shallow ploughing and wide planting.

"Here our men of experience prove they are acquainted with the effect, without knowing, or even inquiring into the cause. Their mistaken opinion respecting dead earth will be noticed in due place; but it remains here to be proved that the necessity of wide planting is one of the consequences at-

* "The lower leaves turn yellow."

tached to *shallow ploughing*. All plants imbibe moisture from the earth by their roots: if this portion of their sustenance is withheld, though every other species of vegetable nutriment abounds in the soil, the plant becomes sickly, growth ceases, and, finally, death ensues. In search of the necessary supply, the roots of plants are extended in all directions, where the soil is open enough to admit them, and to a distance proportionate to the demand. Two plants of the same kind require a greater quantity to preserve health than one: hence it will appear, that a drought of sufficient duration to extract most of the moisture contained in that part of the soil loosened by the plough, may yet leave sufficient to preserve one plant in health; but if divided, both must suffer, for neither can penetrate the hard unstirred earth below for a supply. But in case of long droughts, no distance whatever will insure Indian corn from suffering when the under stratum is hard and the ploughing shallow, and under these circumstances. Few summers are so wet, but that close planted corn, at some period of its growth, discovers the want of a full supply of moisture, which, perhaps, might be amply afforded by one or two inches greater depth of ploughing. They have discovered, that after the first year several succeeding crops will admit of being *closer* planted: the fact is, that the surface having now been for some time cleared of leaves, rubbish, &c. and exposed to the action of frost, sun and dews, that portion of earth, lying originally immediately below the black mould, and called dead earth, which was turned up by the cultivation of the preceding year (for in common soils it is almost impossible to plough so shallow as to avoid turning up some in new grounds), has now acquired a dark colour, and therefore not known to be the same; and, some of the obstacles to ploughing being removed, they almost insensibly go an inch or two deeper, without showing any greater appearance of the yellow or dead earth, so much dreaded, than the preceding year. This furnishes a more extensive pasture* for the roots of the plants growing therein, and also becomes a more copious reservoir for treasuring up moisture for the needful time; and, consequently, affords a supply for a greater number of plants. The second year is generally found to be much more productive than the first, after which our common lands gradually decline.

* "For want of a more appropriate term, the word pasture is used to express the body of loose earth into which plants freely project their roots in quest of food."

"The undecayed fibrous roots prevent much loss of soil by washing the first year: on lands not perfectly level it generally begins the second, and continues annually. The ploughing being about four inches deep, does not afford a sufficient quantity of loose earth to imbibe the whole of the heavy showers that frequently fall during summer; the consequence of which is, as before observed, that when the open soil becomes *saturated*, water must accumulate on the surface, and, flowing off in torrents, bears away a portion of the finest and most valuable part of the soil: succeeding ploughings bring to the surface a fresh supply of mould, which, in turn, follows the last. Thus ploughing and washing alternately following each other, the original soil is soon deposited in sunken places, beds of creeks, rivers, &c.

"This waste is in some measure compensated, and fertility continued, by the fresh earth brought up from below; for the plough continuing to pass about the same depth, must, of course, descend into the unstirred earth in proportion as the open soil is carried from the surface; but of this the cultivator appears ignorant; the proportion brought up at each ploughing being small, and soon acquiring a dark colour by being exposed. I am fully convinced, that in many places the surface is now at least the whole depth of the ploughing lower than at first clearing: of this we need no other proof than the half buried posts in low places, the heads of rivers, creeks and mill-ponds filled up, which are every where to be seen in our hilly cultivated lands.

"But notwithstanding the before mentioned supply of vegetable earth from below, the soil employed in cultivation must annually become less fertile; because the coarse, the heavy and adhesive particles of earth, remain on the spot from the beginning, and those of the same properties, contained in the fresh earth brought from below, also remaining, while the finer and more friendly parts are continually carried away; at length the proportion of fine soil becomes too inconsiderable to answer the purpose of vegetation to any degree of profit. Thus the land becomes sterile, not so much from the vegetable nutriment being extracted from the soil by the growth of plants, as by the soil itself being removed. That this is a necessary consequence of *shallow ploughing*, on lands that are in any degree hilly, in this climate, I trust, has been proved.

"Another material evil that results from the practice of *shallow ploughing*, and which applies to all surfaces, level as well as hilly, is the injury the growing crops sustain for want

of a more regular quantity of moisture in the soil. We know, by experience, that either extreme is fatal to most of our crops. That the practice is calculated to produce both, at different periods, is evident: for, during a long continuance of *wet*, for the reasons before mentioned, the water must *stagnate* in abundance about the *roots* of the *plants:* and, on the contrary, a short continuance of *drought* extracts nearly the whole of the *moisture* contained in the thin covering of *loose earth;* and it is not to be supposed that the tender roots of plants, in quest of a supply, can penetrate the *compact* earth *below*, which has been hardening ever since its formation.

"Hitherto I have principally alluded to summer crops; but if we observe the effects of *shallow ploughing* on winter crops, we shall find the injury to them still greater. All that has been said will apply to them in their autumnal growth; but it is in the spring, and early part of summer, that it often proves particularly injurious, and sometimes fatal to them. Those who have been accustomed to stopping leaks about mills, &c. know, that earth thrown into water, made to incorporate with it, and then subside, settles into a more solid mass, and becomes more impervious to water, than in any other way it can be applied: no ramming is equal to it. The same thing frequently takes place, in a degree, on the surface of our fields. The great rains that often fall about the vernal equinox, drench, and almost render *fluid*, our *shallow worked* soils; the solution of the finer parts entering the pores as the water evaporates, the whole settles into a *compact mass*, and so remains till harvest; for, notwithstanding it may be frequently moistened, yet no other disposition of parts can be supposed to take place until operated on by frost or the plough.

"This state of the soil is too compact to admit of the free extension of the roots even when moist; but, when hardened by droughts, every particle of nutriment not in contact with some of the roots is effectually *locked up* from the *suffering plants*. So that it often, nay, almost always happens, on lands worked in this way, unless very rich indeed, that crops of wheat that look promising in the fall, and early in the spring, begin to decline towards harvest; and people are complaining of the unfavourable appearance of their wheat. When harvest arrives the straw is almost too short to cut, and the heads about half the proper length, and those not well filled, yielding six or seven bushels to the acre, where twelve or fifteen might have been reasonably expected, from the quality of the soil. These appearances and products agree with my

constant observation for many years past, especially on early sowed corn ground; damages by fly, rust, &c. excepted.

"If *manures* are applied to *shallow worked* soils, their good effects, in general, will be of short duration, as most kinds must soon inevitably travel the road the virgin soil has before them."

Having thus stated the bad effects of *shallow* ploughing, Mr. M. assigns various reasons in favour of *deep* ploughing, and then recites the following experiments:

"A field was sowed with wheat by a tenant, the ploughing from three to four inches; a deep hollow extended across part of the field, in a direction nearly east and west; the side exposed to the north tolerably good; the south exposure very rich. As might be expected, the wheat on the strongest soil made the most promising appearance in the fall, and also for some time in the spring; in the early part of which clover-seed was sown on the whole, which came up well; a drought came on late in the spring; the south exposure *drying first*, the wheat soon showed the effects of it; and the drought continuing, a considerable part entirely *perished;* the north exposure also suffered, but being more shielded from the action of the hot sun, was not so effectually dried. At harvest it was much the best wheat, notwithstanding the superior richness of the soil on the other side. A still greater difference appeared in the young clover: on the south hill side it was almost entirely killed, on the other very little injured.

"I have had some experience of the beneficial effects to be derived from *deep ploughing*; but the obstructions in most of my fields (particularly large stones just below the surface) have prevented my adopting the practice so fully as I could wish; yet the success that has always attended my experiments, in conjunction with my observations on the practice of others, has been conclusive evidence to my mind.

"In the year 1795 I took possession of my present farm, and had a field ploughed for wheat, which had been thought, for several years before, too poor to cultivate, either in wheat or Indian corn. I saw rye growing on the best part of it, two years before, just before harvest, that I think would not yield two bushels to the acre. It was ploughed early in the spring, about eight inches deep, and repeated, with harrowings, at proper intervals, several times during summer. It was sown about the last of the ninth month. The soil being weak, the growth in the fall was slow, as also in the spring, yet regular; the colour always good, and no appearance of suffer-

ing, either from *drought* or *wet*. At harvest the straw was not tall, nor thick on the ground, but the heads large and well filled; the product between sixteen and seventeen bushels per acre, except a part of the field, sown with a kind of wheat I was not before acquainted with, which was too thin, in consequence of a short allowance of seed. I observed the state of the soil, from time to time, until *harvest*, and found that, even *then*, it was open and in good tilth, except a crust of two or three inches next the surface.

"In the spring of 1796, with a large plough and four horses, I broke up part of a field. I measured the ploughing frequently, and found it, in many places, eleven inches deep, and no where less than seven; so that the average was at least nine. This piece contained about four acres, on a gentle declivity; the surface too much exhausted to pay for cultivating any crop in the common way. This ploughing brought to the surface about five inches of earth that had never before been exposed, which was principally clay; at the upper edge of the piece of a bright yellow, which became gradually paler further down, and of a bluish appearance near the lower side. After several stirrings, it was sown with buckwheat the same year; the crop tolerable. After the buckwheat came off, the ground was ploughed and sown in rye, in the eleventh month; very little of which came up, owing, as I suppose, either to its being too late put in the ground, or the seed not good. It remained without further tillage until last year, (1800), when it was again sown in buckwheat, which grew so large as generally to fall. Before it was ploughed in the spring, I took several of my friends to see the difference in the appearance of this piece and the ground adjoining, that had lain the same length of time out of tillage: it was discernible to a furrow. The *deep ploughed* piece appeared of a fine open texture, and *dark* colour, thick set with white clover: the adjoining ground, compact and hard, of a *pale* ash colour, bearing scarcely a blade of any other kind of grass than that common to old fields, known by the name of poverty-grass. In short, one had the appearance of an exhausted old field, and the other of land lately manured. Those who expressed a sentiment on the subject, were of opinion, that to those who did not know what occasioned the difference, the *deep ploughed* piece would sell for double the price of the other.

"Part of another field, from having a very retentive clay near the surface, was of that kind called cold or sour land,

and was thought unfit to produce any crop; either water or ice generally appearing on the surface, in an open time in winter. This was so thick set with white flint-gravel and stones, that the first ploughing could not be deep; but having cultivated several crops on it, taken off the largest of the stones, and, consequently, been able to get a little deeper at each succeeding ploughing, the nature of the ground seems altered, so that now there is seldom either water or ice to be seen on its surface, more than is common to other places. It is now in red clover, very little of which has been injured by the late open winter. This piece has been manured; it is therefore unfair to ascribe the quantity of the crops, which have been good, to deep ploughing only; though I am of opinion, that on such land manures are not of much consequence without it."

Mr. M. very properly ascribes the prevalence of shallow ploughing to habit and prejudice, which exert their baneful effects upon several other operations in agriculture. Of these he mentions particularly the destructive custom of clearing wood-land and destroying timber at the most wasteful and wanton rate in some of the lower counties of Maryland and a great part of Virginia; the pernicious application of labour in hoeing and collecting hillocks of earth around the clusters of Indian corn in the Southern States; and the feeding their live-stock from the corn-house, at great expense, while the more economical and fertilizing practice of sowing grass-seeds, and thereby increasing pasture, is miserably neglected.

The remainder of this performance is chiefly devoted to practical directions on the collection and application of cow-yard and hog-pen manures, and on the succession and rotation of crops. Various useful remarks occur on the culture of potatoes, pease, beans, buckwheat, clover, barley, wheat, oats, Indian corn and tobacco; as well as instructions concerning farming-stock and pasture, and the means of increasing the latter by the aid of gypsum, which, he thinks, acts by rendering the soil stimulant.

Our inclinations would lead us to give a more detailed account of this part of the work, did we not flatter ourselves that many of our readers may be encouraged to peruse it entire. We can freely recommend to them a publication from which we have derived both pleasure and instruction; and assure them that it has no appearance of coming from a speculator or a theorist, but from an experienced, judicious, and PRACTICAL FARMER.

ART. II. *A Brief History of the Mississippi Territory; to which is prefixed a Summary View of the Country between the Settlements on Cumberland River and the Territory. By* James Hall, *A. M.* 8vo. pp. 70. *Salisbury (N. C.)* Coupee. 1801.

IT having been judged proper, by the General Assembly of the Presbyterian Church and the Synod of the Carolinas, to send Missionaries to the Mississippi Territory, the reverend author of the performance before us was one of the ministers appointed for that service. From Nashville he and his associates proceeded on horse-back, by way of the Chickasaw nation, to the place of his destination, where he arrived in December, 1800. He left the Mississippi Territory near the end of April, 1801.

During the time of his journeying and residence, Mr. Hall improved the intervals of his gospel-labours in collecting information concerning the natural history, discovery, settlement, climate and productions of this part of the United States. The historical materials he obtained from the French History of Louisiana, and the Attorney-General's Report to Congress. The rest were derived from his own observation, and the conversation of discreet and credible persons.

The arrangement of the work is not very regular, nor does there appear to have been much pains taken with the style. It seems to have been written in haste, as the author's avocations from professional employment would permit. And although we think he has given his pamphlet a title by far too important, in denominating it a "History," yet there is a variety of information contained in it which we believe may interest our readers.

Mr. H. begins by relating what he particularly observed in passing from Cumberland River to the Mississippi Territory; asserting, what has since been confirmed by Mr. Hawkins, that spinning, weaving and agriculture, are making considerable progress in the Chickasaw villages. The boundaries of this territory, as purchased from the natives, he describes in the following words:—"Beginning on the eastern bank of the Mississippi, where it is intersected by the thirty-first degree of north latitude; thence along that parallel sixty miles, which divides it from West-Florida on the south; thence a direct course between north and west, until it strikes Yazoo River, ten miles above its confluence with the Mississippi; thence down

those rivers to the [place of] beginning; including Adams County on the south, and Pickering County on the north. It is situated between the 31st and 34th degrees of north latitude.—Connected with those is Washington County, on Tombigbee, which is separated from the above by a waste of Indian land of more than two hundred miles in breadth. Those three counties were purchased from the natives by the British, when in possession of the Floridas."

He describes this territory as extending more than one hundred and fifty miles along the Mississippi, and as generally well watered, abounding not only in many permanent springs, but with several considerable streams, which, in the progress of improvement, may be made capable of conveying boats and produce many miles into the country. Along the Mississippi lies a body of land from fifteen to twenty miles wide, and in the vicinity of the streams still wider, scarcely any part of which ought to be reckoned barren. Among the trees growing there on the hills and low grounds, are mentioned cypress, cotton-wood, sycamore, holly, wild peach-tree [what is this?], magnolia, red-oak, walnut, cherry, mulberry, elm, ash, iron-wood, and vines. He measured a red-oak, whose circumference, at the distance of a yard from the ground, was twenty-six feet, making a diameter of more than eight feet, and giving us an idea of an enormous tree. Free-stone, and a yellow calcareous earth, which is apparently a concretion of shells, are found there. This, when burned, affords good lime. The land is destitute of stones.

On the soil and produce of this region Mr. H. writes thus: (p. 29.)

"The soil is exceedingly fertile for Indian corn, tobacco, indigo, cotton, hemp and flax. It is also tolerably favourable for wheat, rye, oats and barley; but the grain of these is not so full and heavy as in more northern climes. The tobacco in that country is said to be the best in the union. Cotton is now the staple commodity in the territory, and grows to great perfection. To the maturing of that, as well as other produce, the warmth and length of the season must contribute. The quantity of cotton in the seed, produced from one acre of land, is from 1000 to 2000 (some say 2500) pounds. About 1500 may be considered the average. Hence, from 130 acres of good land, a farmer will expect about 200,000 pounds, for which quantity many farmers were pitching their crops last spring. This will produce 50,000 pounds of clean cotton.

"Almost every farmer of considerable force has a horse-gin on his farm. These will take out of the seed from 700 to 1000 pounds of clean cotton in a day. To those gins the lower class of farmers carry their cotton, which is taken out for the tenth pound. A few gins are turned by water; but dams are so difficult to be kept up, that few risk the expense.

"Garden vegetables grow there in the greatest perfection. I ate ripe strawberries on the last week of March, which were cultivated in a garden, and green pease on the first week of April.

"It is expected the sugar-cane may be cultivated in the lower part of the territory to advantage. A planter made an experiment last summer, fifteen miles above the boundary, which promised success in the cultivation of that article."

The only trade of this country is by means of the Mississippi, either upwards from New-Orleans, or downwards from Pittsburgh, Kentucky and Tennessee. This river is stated to be not more than 180 perches wide at Natchez, and not to become perceptibly broader until it has passed the 31st degree of latitude.

Among the curiosities of the Mississippi Territory, particular mention is made of chasms and sinkings of the earth in various places—of the rapid encroachments of the river upon its eastern bank, wasting it away very fast—and of large portions of undermined ground tumbling into the water. This goes on so violently, that the very place on which the town of Natchez stood, as lately as the year 1780, is now under water at some distance in the river, as the inhabitants who then lived there, and are still alive, assert. Corresponding to this, the low land on the west side of the river, subject to be flooded by the rise of its waters, is above thirty miles wide, and seems to be a dereliction of the river as its channel has gradually shifted by encroachment to the eastward. Remains of ancient mounds of earth, and remains of fortifications, like those found so frequently in other western parts of the United States, occur not unfrequently here. He mentions eight or ten on the lands of one proprietor; and he describes, with some detail, in page 51, a very large work of this kind near Ellicotsville, whose area is near *seven acres*. Mr. H. thinks they were thrown up by the aborigines. (p. 50.)

We extract the following description on account of its very singular nature:

"Another curiosity," says the author in p. 56, "which occurred to my view, was the *pigeon-roost* on a branch of

Big Black, about 60 miles below the Chickasaw nation. The reader may call it natural or artificial as he pleases. An account of the phenomenon there exhibited carries with it such an air of the marvellous, that, had I been the only spectator, it would have been passed over in silence. The pigeons had taken their station in and about a place known by the name of the Hurricane Swamp. The greater part of the large timber had been blown down, and they had perched on the branches of the small timber that remained; and which being broken by them, now hung down like the inverted brush of a broom. Under each tree and sapling lay an astonishing quantity of their dung, of which, from the specimens we saw, there must have been not only hundreds, but thousands of waggon loads. Round each resting-place was an hillock raised a considerable height above the surface, although the substance had been there eighteen months when we made our observations on the place. At that time the heaps were, no doubt, greatly sunk. What bounds they occupied we could not ascertain, as the swamp was so full of brambles and fallen timber that we could not leave the road. It is near a mile diameter; and, as far as I can recollect, their traces were the chief part of the way, and about an hundred paces on the north side of the swamp."

To give an idea of the number and weight of the pigeons, Mr. H. then relates that a hickory tree, of more than a foot in diameter, was alighted on by so many of these birds, that its top was bent down to the ground, and its roots started a little on the opposite side, so as to raise a bank. Trees of a brittle structure were often broken off by them. We leave our readers to ponder these things without any comment of ours. Mr. H. affirms that a bed of clam and oyster shells, as fair as ever lay on the shore of the Atlantic, is to be seen in an old field in the Chickasaw country. (p. 58.)

The following humorous anecdote is related of an Indian Sachem of the Natchez:

"In an early period of the settlement on the Mississippi, a trader made a voyage up the river with a quantity of arms and ammunition, which he exchanged with the natives to advantage. Another adventurer made the same voyage the next year, expecting they had exhausted their ammunition. In this he was disappointed; for they had still a considerable quantity. They were solicitous to know how powder was produced. He gave them to understand that it was sown, and produced by way of crop, and recommended their sa-

vannas as the most suitable soil for that purpose. They accordingly sowed what they had, and purchased his cargo to serve them until the new crop should come to maturity. They set guards round the place to defend it from wild beasts, and watched it with anxiety, but no crop appeared.

"The next year another trader went to the same place with a quantity of goods, was received courteously by the chief, and a house was provided in which he stored his cargo. On the next day the Indians convened, and began to open his bales. One pulled this way, and another that way, until his goods were all gone. He went to the chief and remonstrated. The chief told him gravely, *that as soon as they had gathered the crop of powder he should be paid:* and so he was dismissed."—But we must recommend those who would know more of this writer's narrative and observations to the work itself.

ART. III. *Six Introductory Lectures to Courses of Lectures upon the Institutes and Practice of Medicine, delivered in the University of Pennsylvania. By* Benjamin Rush, *M. D. Professor of Medicine in the said University.* 8vo. pp. 168. *Philadelphia.* Conrad & *Co.* 1801.

THE subjects of this volume are various, composed of introductory addresses to the author's pupils, delivered in successive years to different classes. They all bear the stamp of that animated and interesting manner of communicating instruction for which he has been celebrated ever since he entered upon the duties of a Professor of Medicine. From the ample fund of learning and experience which is annually laid open to those who hear him, he has been induced, in consequence of promises made to many of the members of the classes, to select the following lectures for the press. We hope the same solicitation and compliance which favoured the public with the present collection, will, on some future occasion, be exercised for the purpose of producing a much larger work of a similar kind.

Lecture 1st treats of "*the necessary connection between observation and reasoning in medicine.*" In the discussion of this subject the author exhibits the several pretensions and defects of empiricism and dogmatism, when either separately arrogates to itself the right of conducting medical practice,

and shows that it is only by a combination of both that the science of medicine can be made to convey extensive and lasting blessings to mankind. The syllabus which follows, of his course of lectures upon physiology, pathology, therapeutics, and the practice of medicine, gives an outline of what is most necessary to be taught and understood in those important branches of science, and affords evidence of the Professor's comprehending in his plan of instruction many subjects which have escaped the attention of other teachers.

Lecture 2d exhibits an interesting view of "*the character of Dr. Sydenham.*" A great number of circumstances combine to render that physician an object of veneration, and to hold up his conduct and character as an example to all succeeding times. His improvements undoubtedly form an æra in the history of medicine. In this portrait of him which Dr. Rush draws, the originality, boldness and vigour of his understanding are forcibly represented; his independence of authorities and preconceived opinions; the comprehensiveness of his views, and the solidity of his judgment; his attention to the effects of peculiar seasons and climates; his admirable mode of exhibiting the history and symptoms of diseases; his discovery of the laws of nature relative to the rise, progress, comparative force, and succession of epidemics; the simplicity and efficacy of his remedies; and the correctness of many of his theoretical opinions. In addition to this display of professional excellence, Dr. R. draws, with equal force and felicity, the social, moral and religious character of Dr. Sydenham, in all which respects he is deservedly held to be a model for imitation.

Lecture 3d unfolds a catalogue of the "*causes of death in diseases that are not incurable.*" It is melancholy to reflect, that amidst all the imperfection and feebleness of the medical art, the success of it should be still further curtailed by the ignorance, negligence, prejudices, follies and vices of the sick themselves, or of those who undertake the management of them. Such causes of death are distributed under three heads: 1. Those which are derived from physicians; 2. Those which arise from the conduct of sick people; 3. Those which arise from the conduct of attendants and visitors.

Lecture 4th displays "*the influence of physical causes in promoting an increase of the strength and activity of the intellectual faculties of man.*" On this subject the author treats of the effects produced on the mind by aliment, drinks, opium, tobacco, different positions of the body, dress, weakness,

disease, pain, sleep, certain sounds, temperature of the air, rural and mountainous situations, residence in cities, silence and solitude, darkness and blindness, particular studies and amusements, variety of studies, the exercise of composition, the passions, the will, conversation, politics, religion, association, &c.

Lecture 5th offers a very instructive and interesting view of "*the vices and virtues of physicians.*" The facts and examples which the author adduces on this subject are judiciously selected, and cannot fail to attract the attention of every reader. On the one hand, those professional vices which too often disgrace practitioners of medicine, and hold them up to public detestation, are faithfully sketched; while, on the other hand, for the encouragement and example of all who are awake to impressions of excellence, the author has exhibited some of the most brilliant instances of virtue that can adorn the human character.

Lecture 6th exhibits "*the causes which have retarded the progress of medicine, and the means of promoting its certainty and greater usefulness.*" A very comprehensive enumeration of those causes is delivered in this lecture. What the author says on the subject of nosology is so much entitled to consideration that we shall present it in his own words:

"The last cause I shall mention, which has retarded the progress of medicine, is the division of diseases into genera and species, by means of what has lately received the name of nosology. Upon this part of our subject I shall be more particular than was necessary under any of the former heads of our lecture, for no one of the causes which has been assigned of the imperfection of our science, has operated with more effect than the nosological arrangement of diseases. To expose its unfriendly influence upon medicine, it will be proper first to repeat, in part, what I have published in the fourth volume of my Inquiries and Observations, before I proceed to mention the manner of its operation.

"1st. Nosology presupposes the characters of diseases to be as fixed as the characters of animals and plants: but this is far from being the case. Animals and plants are exactly the same in all their properties that they were nearly six thousand years ago; but who can say the same thing of any one disease? They are all changed by time, and still more by climate, and a great variety of accidental circumstances. But the same morbid state of the system often assumes, in the course of a few days, all the symptoms of a dozen different genera of dis-

eases. Thus a malignant fever frequently invades every part of the body, and is at once, or in succession, an epitome of the whole class of Pyrexiæ in Dr. Cullen's Synopsis.

"2d. The nosological arrangement of diseases has been attempted from their causes and seats. The remote causes of diseases all unite in producing but one effect—that is irritation and morbid excitement—and, of course, are incapable of division. The proximate cause of diseases is an unit; for whether it appears in the form of convulsion, spasm, a prostration of action, heat, or itching, it is alike the effect of simple diseased excitement. The impracticability of dividing diseases into genera and species, from their seats, will appear when we consider the feeble state of sensibility in some of the internal organs, and the want of connection between impression and sensation in others, by which means there is often a total absence of the sign of pain, or a deceitful and capricious translation of it to another part of the body, in many diseases. In the most acute stage of inflammation in the stomach, there is frequently no pain, vomiting, nor sickness. The liver, in the East-Indies, undergoes a general suppuration, and sometimes a partial destruction, without pain, or any of the common signs of local inflammation. Dr. Chisholm, in his essay upon the malignant West-India fever, mentions its fatal issue in two sailors whom he dissected, in one of whom he discovered great marks of inflammation in the lungs, and in the other a mortification of the right kidney; but in neither of them, he adds, was perceived the least sign of disease in those viscera during their sickness.* Baglivi found a stone in the kidney of a man who had complained of a pain only in the kidney of the opposite side during his life. I have lost two patients with abscesses in the lungs, who complained only of a pain in the head. Neither of them had a cough, and one of them had never felt any pain in his breast or sides. Many hundred facts of a similar nature are to be met with in the records of medicine. Even in those cases where impression does not produce sensations in remote parts of the body, it is often so diffused, by means of what has been happily called, by Dr. Johnson, 'an intercommunion of sensation,' that the precise seat of a disease is seldom known. The affections of the bowels and brain furnish many proofs of the truth of this observation.

"Errors in theory seldom fail of producing errors in prac-

* "Vol. i. p. 184."

tice. Nosology has retarded the progress of medicine in the following ways.

" 1st. It precludes all the advantages which are to be derived from attacking diseases in their forming state, at which time they are devoid of their nosological characters, and are most easily and certainly prevented or cured.

" 2d. It has led physicians to prescribe exclusively for the names of diseases, without a due regard to the condition of the system. This practice has done the most extensive mischief where a malignant or inflammatory constitution of the atmosphere has produced a single or predominating epidemic, which calls for the same class of remedies under all the modifications which are produced by a difference in its seat and exciting causes.

" 3d. It multiplies unnecessarily the articles of the materia medica, by employing nearly as many medicines as there are forms of disease.

" I know it has been said, that by rejecting nosology we establish indolence in medicine; but the reverse of this assertion is true: for if our prescriptions are to be regulated chiefly by the force of morbid excitement, and if this force be varied in acute diseases by an hundred different circumstances, even by a cloud, according to Dr. Lining, lessening, for a few minutes, the light and heat of the sun, it follows, that the utmost watchfulness and skill will be necessary to accommodate our remedies to the changing state of the system."

From the brief account of this publication which our limits impose, we are persuaded our readers will be induced to peruse the whole with attention.

ART. IV. *Medical and Physical Memoirs, &c. By* Charles Caldwell, *M. D. &c.*

[Continued from p. 204, and concluded.]

MEMOIR III. *On the Winter Retreat of Swallows.*

THREE different opinions are stated by the author to be held by naturalists relative to the winter retreat of swallows, viz. 1st. That they migrate from high latitudes, and pass the winter in warm climates. 2d. That, instead of migration, they retire to rocks, caverns, hollow trees, and other places of security, where they spend the winter in a state of

torpidity. 3d. That they retreat, at the close of summer, to the bottoms of rivers, lakes, and arms of the sea, where they remain torpid in the mud till the return of the next spring.

The object of this memoir is to establish the opinion of the migration, and to oppose that of the submersion of swallows.

In the first place Dr. Caldwell takes a brief view of the evidence in favour of the submersion of swallows. He examines the testimony of Dr. Wallerius, a Swedish chemist—of Mr. Peter Cole, of New-York (see Med. Repos. vol. ii. p. 178, first edit.)—and of Professor Kalm. In all their accounts of the submersion of these birds, he believes that there is reason to suspect the correctness of their observations; and he assigns a variety of objections to their statements, as well as of suppositions concerning the manner in which their mistakes may have arisen.

In the second place Dr. C. offers a considerable number of facts and arguments, which, while they militate, in his judgment, against the opinion of the submersion of swallows, favour that of their migration to distant climates. One of the most remarkable of these facts is an experiment which the author tried upon two swallows which he immersed in the water about that season of the year in which these birds annually disappear. They were both drowned, and apparently dead, in the short space of time requisite, in common cases, to produce that effect. After being allowed to remain under water some hours, every exertion was made to restore them to life, but all in vain.

We cannot agree with Dr. C. that such an experiment as this, nor that his physiological arguments drawn from the structure and functions of swallows, can have any decisive effect on the determination of this question. If the submersion of swallows be really true, it must be performed at certain times and places, in modes and under circumstances which we cannot arrange nor imitate. It must be acknowledged, indeed, that his facts and reasonings ought to prevent us from lightly giving ear to the accounts of submersion, and to induce us strictly to scrutinize the authenticity and the details of every narrative on the subject. There is, however, an assignable weight of testimony (much greater, perhaps, than has been hitherto obtained), which would be sufficient, with reasonable minds, to compel belief, and would render the explanation of the principle altogether subordinate to the admission of the fact.

MEMOIR IV. *Strictures on a "Memoir concerning the Disease of Goitre, as it prevails in different Parts of North-America, by Benjamin Smith Barton, M.D. &c. &c."*

In this concluding part of the work under consideration, Dr. C. opposes the opinion, or rather the conjecture of Dr. Barton, that the principle remote cause of goitre may be a miasm of the same species as that which produces intermittent and remittent fevers, dysenteries, and other similar complaints.

The plan which the author pursues in these strictures is, 1st. "To inquire into the nature and force of the evidence on which the above belief is founded;" and, 2d. "To state a few arguments which seem to militate against the opinion that goitre and bilious fever result from the same cause."

Under the first head Dr. C. combats the arguments deduced by Dr. Barton from the frequent appearance of glandular affections in countries in which intermittent fevers prevail; from the general prevalence of such fevers in those situations where goitre is found; from the complexion of goitrous persons; and from information received, that, in the State of New-York, those persons who are affected with goitre are commonly exempt from intermittents, though in the midst of persons labouring under these latter complaints. In order to oppose these reasonings Dr. C. denies the fact that glandular affections, excepting those of the liver, spleen and mesentery, are more frequent in countries subject to the prevalence of intermittent fevers than in others; and, as to the remaining facts, he endeavours to explain and draw inferences from them of a very different kind from those of Dr. Barton.

Under the second head Dr. C. proceeds to state some arguments which he supposes to militate against the opinion that goitre possesses a common origin with bilious fevers. These are as follow: that goitre never appears in many of the most extensive of those tracts of low country in which intermittent and remittent fevers annually prevail; that goitre, though not exclusively a disease of the female sex, attacks women much more generally than men; that this disease does not appear to be more troublesome from the middle of summer till the close of autumn than at other seasons of the year; that this disease does not, like bilious fevers, make its first appearance in summer and autumn; that it does not, like diseases or forms of disease which spring from a common cause, alternate or exchange forms; that fevers arising from the miasmata of putrefaction do not, like goitre, produce a tendency to fatuity;

that the latter disease is not, like bilious fevers, subject to periodical revolutions of prevalence and violence; and, lastly, that the miasmata of marshes are never known (except, perhaps, in the hepatitis of the east) to produce a topical and chronic affection, unless as the result of preceding general fever.

We have thus given a brief outline of the reasonings adduced by Dr. C. to invalidate this opinion of Dr. Barton. It must be granted that some of them form weighty objections to the admission of the doctrine of the origin of goitre and intermittent fevers from a common cause. But it must be observed, at the same time, that the learned author of the Memoir concerning Goitre foresaw many of these objections in their full force; that he presented his view of this subject chiefly in the form of conjecture, with all the wariness, caution and candour which become philosophical investigation; and that, with all its acknowledged uncertainty, it seems to be the most plausible opinion concerning the cause of goitre which has ever yet been offered to the public.

ART. V. *A Reply to Dr. Haygarth's "Letter to Dr. Percival on Infectious Fevers," and his "Address to the College of Physicians at Philadelphia, on the Prevention of the American Pestilence;" exposing the Medical, Philosophical, and Literary Errors of that Author, and vindicating the Right which the Faculty of the United States have to think and decide for themselves respecting the Diseases of their own Country, uninfluenced by the Notions of the Physicians of Europe. By* Charles Caldwell, *M. D. Fellow of the College of Physicians of Philadelphia, &c. &c. &c.* 8vo. pp. 50. *Philadelphia.* T. & W. Bradford. 1802.

OUR readers will recollect the notice we took of this extraordinary performance of Dr. Haygarth in the department of Review in our last number. Dr. Caldwell, being one of the American gentlemen whom that British physician had undertaken to censure in acrimonious and illiberal terms, vindicates himself, in the pamphlet before us, from accusations which had been so uncivilly laid before the public.

Irritated by the singular mode of attack which Dr. Haygarth had thought proper to commence, Dr. C. gives a specimen of a spirited, warm and indignant reply. When the "Letter to Dr. Percival" first came into our hands, we did

not doubt but our injured countryman would feel irresistibly impelled to measure weapons with his European adversary. Finding himself driven to the necessity of repelling invasion, and guarding against a repetition of similar inroads, he carries the war into the enemy's territory, and lays waste some of his finest provinces with fire and sword. We could have wished that more moderation and justice on the part of Dr. Haygarth had prevented such extremities, or that some mode had been devised to avoid the resorting to the *ultima ratio*. But as self-defence and resentment of a manifest aggression were considered as indispensible, let them serve, at least in this instance, as a memento of the value of peace, of the imprudence of obtruding censures on unoffending foreigners, and of the hazard of crossing the Atlantic to provoke hostilities.

Dr. C. thus repels the indelicate and domineering intrusion of Dr. Haygarth into the medical discussions of America:

"The presumption and folly betrayed by homebred foreigners, in pretending to instruct us in the knowledge of our endemic and epidemic complaints, are strikingly manifested by the following consideration:—European physicians, on their first emigration to the United States, never fail to show themselves ignorant of the nature, and incompetent to the treatment of our common diseases, even when cases of them are submitted to their observation and care. They find themselves under a necessity of serving a second apprenticeship, in order to assimilate their ideas and habits to their new situation, and to render them skilful American practitioners. The most enlightened and liberal of them, that have settled in this country, have made repeated acknowledgment of this truth. How, then, can their brethren and former associates, immured at home, become possessed of, and communicate to others, that knowledge which they acquire only by travel and experience?

"As well might an American physician, who had never visited foreign climates, undertake to teach the nature and cure of the Lepra Græcorum, the Mal d'Alleppo, or the Cochin leg, as a British physician, accustomed only to the complaints of his own country, attempt to impart instruction respecting the diseases of the United States. As well might the Parliament of Great-Britain, in their present ignorance of our circumstances as a nation, attempt to legislate for all our emergencies, as her Faculty to decide for us with regard to the nature, prevention, or cure of our epidemics. By the help of books alone, a physician may, even in his closet, acquire a knowledge of the general principles of diseases; but it is only

by travel, observation and experience, that he can learn to apply these principles to the diversified circumstances of different climates and countries.

"But what shall we say to the magisterial pretensions of Dr. Haygarth in this respect? Whence do they originate, and on what are they founded? Where is the fund of experience to sanction them, or the sources of observation to render them even plausible? Has the Doctor a single qualification, either natural or acquired, which designates him as a man prepared to shed light on the subject of our late epidemics! Has he ever expatriated himself for the purpose of enriching the science of medicine by an examination of nature in foreign countries? Has he ever left the temperate atmosphere of Great-Britain, to gain a knowledge of the diseases of regions that lie nearer to the sun? Such a journey might have both expanded his capacity and augmented his information: for the sun of the tropics has oftentimes ripened into active intellect the hebetude imported from higher latitudes. Has he ever crossed the Atlantic to study the climates, the topography, and the diseases of the United States? Or does his mind possess such an exalted station in the region of intellect, as to enable it to overlook the globe, and to descry and comprehend, at a glance, the scenes that are passing in distant hemispheres? Those who know this gentleman best, will be the last to answer these questions in the affirmative.

"But his conduct may be influenced by different considerations. Perhaps he may found the boldness of his pretentions as an author on the maturity of his years. Many writers less youthful are more modest; and it is to be lamented that grey hairs give no infallible earnest of either wisdom or liberality. Does he derive his self-sufficiency from an education finished in the schools and hospitals of London and Edinburgh? The public teachers of these places, being themselves inexperienced in true pestilential diseases, are unable to impart a knowledge of them to their pupils. Is the extent of his reading the cause of his imaginary superiority over his brethren in the United States? We will not positively assert that he is not a man of profound erudition; but we have no evidence whatever to convince us that he is. But, be the case as it may, books are at best but a secondary source of information, and a mere acquaintance with them should never be set in competition with observation and experience. But perhaps he may pride himself on being a native of the same country which produced a Harvey, a Sydenham, a Cullen, and a Hunter. We entreat

him to remember that weeds may infest the ground which has been overshadowed by the lordly Addansonia, and that the same clime gives birth to the lion and the jackal.

"Were Dr. Haygarth much younger than he is, we might ascribe his presumption to the inexperience and temerity of youth; and, if much older, we might commiserate him as being under the influence of dotage. But, flourishing as he is in the meridian of intellectual manhood, we are sorry to say, that we can trace his unbecoming pretentions and manner to no other source but the extent of his self-conceit.

"What less can we say of a man who, insulated in his observations to the diseases of a few country towns in Great-Britain, and removed a thousand leagues from the scene of action he is examining, presumes to vilify the reasonings of the Academy of Medicine of Philadelphia, a society deliberating on the spot, and consisting of members individually as respectable as himself? What less, I repeat, can we say of such a man, when he has the assurance to annex to the reasonings of such a society, the rude epithets, 'frivolous, inadequate, and groundless?' For the sake of whatever reputation he may now possess, we hope he will, in future, have more prudence than to expose himself by attempting to teach what he does not understand, and more delicacy than to insult others for exercising what they conceive to be a well-founded right to differ from his crude and visionary notions."

After these observations, Dr. C. proceeds to a more particular examination of Dr. Haygarth's performance. In doing this he offers remarks on the character of the author as a scholar, as a philosopher, and as a man of candour and veracity. Under each of those heads he presents strictures and criticisms which cannot fail to derogate from the literary and scientific pretensions of his opponent.

ART. VI. *Explanation of the Synopsis of Chemical Nomenclature and Arrangement: containing several important Alterations of the Plan originally reported by the French Académicians. By* Samuel L. Mitchill, *M. D. F. R. S. E. Professor of Chemistry in Columbia College, &c. &c.* 8vo. pp. 44. *with a Chart. New-York.* T. & J. Swords. 1801.

THE author of this pamphlet and chart, according to the theory of Boscovich, considers all matter as consisting of atoms infinitely small, balanced between attractive and repelling

powers. These atoms are the materials which constitute the greatest as well as the least of the aggregate and compound bodies in creation, as units compose the highest as well as the lowest of integral numbers that can be conceived. Of these atoms we know nothing but from their effects and properties. Their essence is beyond our researches, and their infinite smallness renders it impossible to examine them either by touch or by sight. From their attractions and repulsions, which are all we know about them, we have been able to class them according to their similitudes; and, judging from these, there do not at present appear to be more than between sixty or seventy sorts of uncompounded atoms in the whole fabric of our globe and its atmosphere.

That kind of attraction which takes place between similar or homogeneous atoms is called the attraction of *cohesion* or of *aggregation*, because it compacts atoms of the same kind into aggregates or masses. Another form of attraction is exerted between atoms of *dissimilar* constitution, and is therefore called *chemical* attraction. The atoms of matter are so constituted as to attract each other, and to combine in an endless variety. Observation, however, has taught, that there are certain combinations more frequent than others; as, for instance, those of metals with phlogiston, and of acidifiable bases with caloric. For the purpose of exhibiting these and some other common forms of bodies to more advantage, they are distributed under nine heads, as follow:

" 1. The abstract names of such atoms as are simple and uncompounded, or, in the present state of our knowledge, are considered so. These appellatives are nouns, expressive not of the respective families of atoms in any condition observable by us, but of that pure and abstract state in which the understanding may conceive it possible for them to exist.

" 2. The names of primary atoms when combined with phlogiston; which phlogiston, as herein understood, means that kind of atoms which form the basis of inflammable air or hydrogenous gas, and no other kind.

" 3. The terms employed to express the state of dry fusion, or the condition of bodies melted without the aid or intervention of water. This is the condition of bodies whose atoms are considerably separated by anticrouon, the repelling principle, or what has been denominated caloric, though not sufficiently to evaporate them.

" 4. The names given to atoms so far repelled by anticrouon or caloric as to form gases or permanently elastic

fluids. This is a state which rarely, if at all, exists, but which is necessary to be expressed in order the better to explain their states when combined with water.

" 5. The names and terms under the fifth title are intended to express the state of *dry* oxyd and acid. In this form bodies seldom or never exist (except metallic calces), on account of their very strong attraction for moisture. But this condition of *dry* oxyds and acids was necessary to be expressed for the sake of giving a better idea of their modifications by water.

" 6. Names and terms expressive of that condition of atoms when, after much repulsion by anticrouon or caloric, and attraction by oxygen, the compound is rendered liquid by water. This applies to acids in their ordinary and fluid state, and to all solutions of bodies in water.

" 7. This title denotes the condition of certain atoms, which exist in the form of gas, combined with a portion of water, and sometimes with oxygen. In this are included all the acids and alkalies when rarified to the vaporific state, as well as all gases or aëriform fluids.

" 8 Atoms, after combination with oxygen into oxyds and acids, combined with other bodies; as happens to acids in their junction with earths, alkalies and metals, to form the very numerous order of neutral salts.

" 9. This title includes acidifiable substances, and some others in connection with substances not acidifiable, and not forming neutral salts. Among other things, metallic ores and alloys of metals belong to this division."

The additional divisions here made to those of the chart of the French Academicians will be immediately perceived by the reader.

As the author introduces the term *anticrouon* to signify what the French academicians call caloric, we present his reasons for this proposal in the following quotation:

" *Anticrouon*, το αντικρουον, is the neuter termination of the active participle of the present tense, from the verb αντικρουω, to repel or keep at a distance. It is intended to express the principle or agent which produces repulsion among the atoms of matter: and as repulsion always exists among the constituent elements of bodies, the repelling principle would always seem to be there. In many cases we can ascertain its presence by our sensations, by instruments and machines; and we know that, according to the force or intensity of it, may a solid body undergo mere expansion, or be dilated to a liquid or

melted state, or be repelled so powerfully as to become volatile or to rise in vapour. A word which expressed all these effects, or rather the influence by which such effects were produced, has a happy operation upon the mind, by suggesting to it invariably the principal modifications of matter in which it is instrumental. It was stated in the preliminary remarks, that the atoms of which bodies consisted did not come into *perfect contact* under any circumstances in which we were acquainted with them, because there was repulsive agency among them powerful enough to prevent it. This repulsion has, by some philosophers, been supposed to inhere in the atoms themselves, and to be a part of their nature; while others ascribed it to a foreign agent introduced among them. However the fact may be, this we know for certain, that when, from the solar rays, from culinary heat, or the fire of a furnace, the repelling principle, or anticrouon, is introduced among the particles of any body, it increases the common repulsion existing there, and, if carried far enough, will evaporate and dissipate them. Since, therefore, repulsion, as far as we are acquainted with it, in bodies considerably heated, is occasioned by anticrouon, it is fairly presumable, that, in other cases, where its effects are less obvious to us, as in their ordinary and low temperatures, a more moderate action of the same principle imparts to their component atoms their common or ordinary rate of repulsion. We know of no state wherein there is an absolute or total privation of caloric or anticrouon, and, of course, we know not of any condition of bodies wholly exempt from its repulsive power. Anticrouon, then, the repeller, the repelling principle, or the principle of repulsion, seems, upon strict examination, universally to produce separation or dilatation among the atoms of bodies after its introduction into them. And this idea is more simple than the supposition of one repelling power inherent in the atoms themselves, and another as an inseparable property of caloric.

" Among the effects of anticrouon upon sentient beings, as man, is a sensation called heat; and this name has been very generally used also to signify, besides the sensation, the agent causing the sensation. There would, for this reason, be great impropriety in retaining, for philosophical purposes, the word ' heat,' which denotes both the stimulus which excites the sensation and the sensation excited. But there is a more serious objection than this: neither the term heat, nor any of its derivatives, express chemical or physical qualities. They

signify only *one* of the various modes by which anticrouon, or the principle of repulsion, operates; to wit, the sensation it excites when moderately acting on the human organ of touch; but there are numberless gradations of repulsion among the atoms of natural bodies, which produce no acute sensation at all upon it. And when the human skin is acted upon by some of the lower degrees of it, the effect wrought is not called *heat*, but *cold*. Hence it appears, that the sensation of *heat*, which gives a term that tinctures all this part of philosophy, is very limited even in a sentient being; and two words, with opposite meanings, are introduced into all discussions, and are unavoidably, by these means of association, brought to mind. To show how improper the word heat, or caloric, or calorific, is, we need but to recollect that the principle so named existed before man existed to feel it; and may continue to operate upon more durable things, when the race of man shall be no more. The word 'fire' is also improper, as it signifies merely another mode by which anticrouon acts, that is, in the decomposition of inflammable substances, with an extrication of sensible heat and light. The most obvious and extensive effect of this sort of atoms being repulsive, their generic name ought to be derived from this property, and to express it. Wherever the word was pronounced, we should think of this predominating operation of it upon all matter, without the needless incumbrance of words, and their ideas and associations, derived from human feeling. Thus *dilatation* might be the common name to express the effect of anticrouon on hard and fixed substances, as the metals; *expansion*, to signify an enlargement of volume in the same or similar bodies, when melted; *evaporation*, the conversion of fixed substances to airs or vapours; *heat*, when affecting the nerves of a sentient being in a particular manner; *fire*, when acting on a combustible substance, &c. By modelling the language in this manner, anticrouon, or the repelling principle, would always be presented to the mind; and the heating effect on man and other creatures, instead of being incessantly obtruded on the memory, would be occasionally brought up when that particular effect of anticrouon was under consideration. But as those effects of repulsion called *heat* and *fire* are most familiar to man, they have been most commonly introduced into discourse and writing, not only about *sentient* bodies and *combustible* substances, but have been applied to those which possess neither feeling nor inflammability. The phenomena of anticrouon have therefore been confusedly stated,

and some incongruities have clouded the subject. If the earth is to be reserved for destruction by fire, the elements to be melted with a fervent heat, and the works that are therein to be burned up, all that is necessary to be conceived for the accomplishment of such a dissolution of the fabric of nature, is a mere abolition of the power of attraction among the atoms, or an increase of repellency, whereby the existing coherence may be overcome. This destruction of the compages of matter is the counterpart of that process, which, during the time of its organization, drew its atoms together. And the same providence which, by a predominance of attractive power, organized the world, can, by simply augmenting the repulsive power (anticrouon or fire), instantly disorganize it. And this sentiment, so understood, is as agreeable to correct philosophy as to sound theology.

"Thus it appears that anticrouon, or the repelling power, is incessantly present in all the substances with which we are acquainted. Being the universal cause of repulsion in the atoms of which bodies consist, there is an impossibility of conceiving their present constitution without taking it into consideration: and, therefore, as indispensibly necessary to the existence of all the modifications of matter, *anticrouon* the repeller, instead of caloric the heater, is placed at the head of the list."

In this improved chart the author has likewise substituted phlogiston for hydrogen, and septon for azote, on grounds which have been amply exhibited in former parts of this work.

MEDICAL & PHILOSOPHICAL NEWS.

MEASLES.

THIS disease made its appearance in the city of New-York about the middle of last November. For several weeks it crept slowly from one family to another; so that, at the end of December, it had made but little progress from the neighbourhood where it was first observed. Early in the month of January it began to spread over the city, and throughout that month and February, till the present time (24th Feb.), it has continued to prevail, and has been remarked to attack such as had not previously undergone the disease much more universally than on former occasions of its epidemic appearance.

The regular character of the measles has been generally preserved in this instance of its epidemic prevalence. In most cases the disease has been mild; a large proportion of the few fatal cases having arisen among those who, from ignorance, inattention or poverty, did not treat the disorder with the requisite care. How far the extreme mildness of the winter may have modified the character of this epidemic, we cannot undertake to decide.

There is no doubt, from a number of cases observed in the course of this season, as well as heretofore, that spurious forms of measles, insufficient to protect the system from subsequent attack of the true disease, occur in a manner very analogous to the spurious appearances of small-pox and of the vaccine disease. Many persons who, on former occasions of the measles prevailing, and after exposure to the contagion, had exhibited certain irregular appearances of febrile, catarrhal, and eruptive symptoms, mistaken for the true disease, have been attacked this season with measles in an exquisitely genuine form.

A NEW BOTANICAL WORK.

A natural history of St. Domingo is now compiling by Dr. Edward Stevens. The materials of this work were chiefly collected by this gentleman during his residence in Cape-François, and the other settlements of that colony, as Consul-General of the United States. It will contain descriptions of

more than sixteen hundred of the indigenous plants; and be embellished with engravings of many of the more remarkable species, done by the best artists in America. This highly desirable performance will be published in large folio, and will be the most considerable publication of the kind ever made on this side the Atlantic. It will likewise comprehend the medical and economical qualities and applications of the vegetables treated of.

GOLD AND PLATINA FOUND AMONG THE MOUNTAINS OF ST. DOMINGO. *Extracted from a Manuscript of Mr. Giroud, lent to Dr. Mitchill by Dr. Stevens.*

In the year 1796, certain interior regions of St. Domingo were surveyed with a mineralogical eye by Mr. Giroud. He was appointed by the French government to travel and explore that colony, and made a report of his observations and discoveries to Mr. Roume, the agent of the republic for the time being in that island.

In one of his letters, dated at Cape-François, 6th July, 1796, he informs that at *Dondon* he had found platina mixed with the ferruginous sand which is so frequent in the ravines of that country. In the neighbourhood of *St. Raphael* he found another ferruginous sand mingled with particles of gold and platina. He sent specimens of these to the National Institute in France. In the districts of *Angusturo*, *las Sanjas*, *Savana Iglesia*, *Janico*, *Gausave Hagua*, *Juana Huma*, and *la Cinènèga*, Mr. Giroud says nature has distributed gold with a liberal hand. It is of various forms (paillets, graines et grosses pepittes), and disseminated through a sandy grit, among rounded pebbles, and among an argillaceous and reddish earth abounding in iron. The mountains in these parts he considers as of the *ternary* or *tertian* order, and evidently formed from the ruins and crumbling of the higher and larger mountains of the *primitive* and *secondary* kinds. He is a Neptunian in theory, and believes they assumed their present form and structure at the time when the ocean still occupied the valley which extends from the *Bay of Samana* on the east end of the island quite across to *Daxabon* and *Monte-Christo*, between the two chains of the *Puerta Plata* and *Monte-Christo* on the north, and of *Cibao* on the south. In this extended valley calcareous substances and relics of the ocean are often found, and in these *tertian* mountains they are jumbled together with the granitical and primeval materials of the *an-*

cient mountains. This auriferous valley is cut, furrowed, and in many places divided by streams of water, the principal of which are, *Rio-Verde*, *Hagua*, *Jaque*, *Yuna Huma*, *Janico*, *Cibao*, *Mao*, *Magna*, *Guaravin*, and *Hamina*. Gold is found hereabout over a surface of sixty square leagues, though much more abundantly in some places than in others. Every where the rivers, torrents, brooks and rills, wash down gold in the before mentioned forms, particularly after rains.

July 29th, 1797, Mr. Giroud viewed the two great chains of primitive mountains in St. Domingo. They are GRANITICAL. The one ridge to the south-east of St. Jago rises above the clouds, and is called Mount *Cibao*, or, as the inhabitants contract it, *Bao*. The other, which is also hidden by clouds, is called *Lomas Pelades* of the great *Sierriana*. From these many large rivers take their rise. Accompanied by two mountaineers, named Nicolas Fernandez and Pedro Rodrigeuz, he travelled to their summits; and he computes the elevation of the highest peak, that of *Antonsepo*, to be 1400 toises (8400 French feet) above the level of the ocean.

In the neighbourhood of *Cibao*, and at the foot of *Lomas Pelades*, there is an abundance of the granitoidal rock called Gneiss, the Saxum Metaliferum of the Saxons, and of the best informed miners. Among this are found great quantities of iron and copper pyrites. He believes some of it contains gold. These primitive mountains and their waters are, however, less abundant in gold than the countries and streams below.

He mentions the river *Cibao*, so called from the mountains of Cibao, as abounding in gold, and to the westward of them others as rich. In *Guaraguana* and *Acao* he says there is gold. He procured it himself by washing the sand, and found it frequently mixed with platina. The common washers of these golden sands hereabout always find grains of platina mingled with those of gold; and a ferruginous sand, attractible by the magnet, always accompanies them. They are particularly industrious to pick out and throw away the larger particles or grains of platina, because the goldsmiths of St. Jago will not buy their gold if it contains more than a certain quantity of platina. They know platina only by the names of *emerete* or *puntal*, and consider it as the pest of the virgin gold which is brought them to work, as they know no other method of separating the two metals than that of picking them out by hand.

Mr. Giroud concludes, that besides the vast quantities of

vegetable produce which this fertile island can afford, it contains the sources of immense riches in its *mineral* department. He thinks the latter can be attended to without the least interference with the former. The gathering of gold will not in the least prevent the cultivation of sugar and coffee; though he justly considers agriculture as preferable to mining.

THE WHITE-BACK OR CANVASS-BACK DUCK.

This species of duck is more extolled for the delicious flavour of its flesh than any other of the whole order of water-fowl. It is supposed by some to be the *sheldrake* of the European ornithologists, which is a bird very different from the saw-billed bird of that name in New-York.

There is a fine specimen of the canvass-back in Mr. Peale's Museum. It is a migratory fowl, and breeds in the regions north or north-west of the territory of the United States. The old ones return southward with their young, so as to arrive on the coast of the Atlantic towards the end of autumn or the beginning of winter. There they remain until the approach of warm weather, and then fly away to their more northerly summer residence.

Although these ducks migrate in this manner, there are very few places in which they are found. It is not known that they frequent the waters north of Chesapeake-Bay; though it has been affirmed that a straggler has now and then been killed. Indeed, their range to the southward is so circumscribed, that they are rarely or never seen at present any where but on the waters of the Susquehannah and the Potowmack; and in vain do the sportsmen seek them in the rivers of the Southern States. Sometimes they are seen on the tables of the luxurious in the city of New-York; but in these cases they have always been sent from the Chesapeake. Formerly they were frequent in James-River, in Virginia; but latterly they have deserted it altogether. This abandonment of a place formerly resorted to by them is supposed to be owing to a failure of the particular food which formerly invited them there.

This food is of the vegetable kind; for it would scarcely be expected that a bird of such a delicate taste at the table should subsist on animal aliment. They feed upon the roots of a coarse long grass which grows in the two before-mentioned rivers, higher toward their sources than the *salt water* extends. And these roots, which are large, succulent, and resemble,

in some respects, those of celeri, are procured by diving: for the canvass-back is a *diver*.

Within the remembrance of people now alive, canvass-backs were so numerous on those parts of the Potowmack where their food abounded as to cover acres of its surface, and to be seen in flocks for a mile or more in extent. They might then be bought from three-pence to six-pence a piece. At present (1802) they are become so scarce that few are killed, and a single one costs seventy-five cents or a dollar. Whenever ice covers the *fresh water* of the Susquehannah and the Potowmack, and forces the canvass-backs to leave their feeding-places, and go down to the salt water of the Chesapeake and live as other ducks do, they very soon become lean, and their flesh loses all the excellence of relish for which it is so highly prized.

The increase of navigation on the rivers disturbs them considerably: but, in addition to that, they are so incessantly alarmed and destroyed by the gunners, that their numbers are diminishing very rapidly. It is therefore expected, that in a few years they will desert these places of resort altogether, and seek an asylum in some region less frequented by their devourer, man.

CURIOUS FACTS CONCERNING THE MODE OF GENERATION IN THE AMERICAN BEAR.

The singular departure from the common course of nature in the procreation of the opossum and the shark, are already known; but the manner in which the fœtus is matured by the female bear is not so generally understood. The following information was given to Mr. Franklin, Senator of the United States from North-Carolina, by the hunters. This animal hybernates, and, during the winter, retires to hollow trees and caverns, but does not become torpid, or sink into the sleeping state. Though found often in great numbers on the frontier settlements, and frequently killed and eaten by the inhabitants, there has never been an instance of a female killed in a pregnant condition, or big with young. The reason is, that almost immediately after conception, the fœtus, while shapeless, and resembling merely a small animated lump, is excluded from the womb. Thus born, and exposed to the open air, it has no connection with the teat like the opossum, nor with an egg like the shark. There is no trace of a placenta nor umbilical vessels. The growth of this rudiment of a future bear is supposed to be promoted by licking; and the sa-

liva of the dam, or some other fluid from her mouth, appears to afford it nourishment. In the course of time, and under such management, the limbs and organs are evolved, the surface covered with hair, and the young cub at length rendered capable of attending its parent. Thus far the inquiries of the hunters have gone. The facts are so curious, that the subject is highly worthy of further investigation. And when the entire history of the process of generation in this animal shall be known, new light will be shed upon one of the most obscure parts of physiology. It is to be hoped that gentlemen whose opportunities are favourable to the prosecution of this inquiry, will furnish the learned world shortly with the whole of these mysterious phenomena.

THE EGG OF THE GOAD-FLY DEPOSITED IN THE BACKS OF NEAT CATTLE.

The large black fly which torments cattle and horses excessively during the hot season, not only sucks blood from the backs of these creatures, but makes a puncture through the skin, and lays its eggs there: at least this is a frequent occurrence among neat cattle, though not known to occur among horses. The egg so deposited there grows to the size of a large worm nestling in the cellular membrane. This gradually works its way through the skin, and rolls off to the ground, where, in process of time, it hatches to the common black goad-fly. A gentleman of observation and respectability, and a practical farmer, has verified this by an experiment. Observing his herds of cattle to be infested with these animals, which in that state are called *warbles*, he was desirous of knowing what perfect insects (imago) would proceed from them. For this purpose he enclosed some of them in cases, so that there could be no communication with external objects; and he found *the warbles were converted to goad-flies.*

IMPROVEMENT IN QUARANTINES.

On Tuesday, January 11, 1802, Dr. Mitchill moved a resolution in Congress, that a committee should be appointed to report what alterations were necessary in the law respecting quarantines. The resolution was agreed to, and a committee appointed. The committee consists of Messrs. Mitchill, Eustis, Leib, Archer and Lowndes. The particular object aimed at is to cleanse ships and vessels by means of *alkaline salts and leys*, and to explode the miserable and delusive practice of fumigation—in short, to apply the modes of *cleaning*

houses to the purification of ships. This will reduce the quarantine of vessels *to the simple process of cleaning by alkalies,* and eventually remove from commerce most of the tedious and burthensome restraints under which it is now groaning. Science will have a glorious triumph; and the American government will set a noble and liberal example to the whole civilized world.

YELLOW FEVER PRODUCED IN THE WEST-INDIES BY THE GASES EXHALING FROM HERRINGS OF NORTH-CAROLINA PUTREFYING THERE.

The following instructive facts are taken from a letter of Mr. Samuel Russel, of New-York, to Dr. Mitchill, dated January 12, 1802. About the 10th of June last a merchant purchased two hundred barrels of North-Carolina herrings. They were of the sort called *dry-salted.* They were stored in the city of New-York until the first of July, and at that time were discovered to be considerably offensive. However, they were put on board a vessel for exportation, and chiefly stowed on deck. In this condition they were carried to the island of St. Croix. But the market being bad, it was determined to run down to Kingston, in Jamaica, where the vessel arrived near the end of August. The captain sold his herrings to an auctioneer, and delivered them into his store. By this time the fish were discovered to be fast spoiling, and advancing rapidly through the putrefactive process. The master of the store and his clerk lived and slept in a room directly above that in which the fish were now laying and corrupting. They both were invaded by *yellow fever,* and after suffering a very violent attack of the disease, recovered their health with great difficulty. The opinion prevalent in Kingston was, not that a supposed contagion was imported there, but that *a poison, engendered within the barrels of corrupting fish,* had escaped into the store and room, and had been the exciting cause of the disorder; operating there in the West-Indies as it does here in the United States.

Dr. JOHN MACE, *of Dorchester County, Maryland, in a Letter to Dr.* MILLER, *gives the following Account of a Malignant Disease in that County in the Summer and Autumn of* 1800.

"In the year 1800, a malignant, bilious or yellow fever prevailed in the lower part of Dorchester County, State of Maryland. This part of the county consists entirely of low land,

with a large tract of swamps and marshes. The water in these places usually continues plentifully all the summer; but this summer it was nearly all dried up. The pestilential fever began about the 10th of August, and continued its ravages until the next November, assuming different forms according to different circumstances. It was attended with great heat, preceded by chills; violent pains in the head, back, hips, and sometimes the knees and breast; nausea and vomiting, with a burning pain in the stomach, black discharges from the intestines, a muddy colour of the whites of the eyes, hæmorrhages from the bowels, and a yellow colour of the skin. Bleeding, with active cathartics, the application of blisters, and a salivation, were the only successful remedies; while the Peruvian bark, and other similar medicines, evidently increased all the symptoms of the disease. The yellow fever also occurred in the same place, attended with the usual symptoms of malignity, in the course of the last summer and autumn. I have been induced to give the above account, because it will tend, in some degree, to support the doctrine of the domestic origin of American pestilence. There were some cases of yellow fever in Dorchester County in 1800, which were brought from Baltimore; but many genuine cases of the disease occurred in persons who had not been near Baltimore, nor any one infected with the complaint from that city. Moreover, it is well known that there have been no cases of malignant fever in Baltimore, in the course of the last year, and yet there have occurred many instances of it in Dorchester County. The doctrine of importation is therefore totally insufficient to explain the origin of the yellow fever in these cases. A more circumstantial account of the epidemics of Dorchester County, in 1800 and 1801, will hereafter be laid before the public."

NEW-YORK VACCINE INSTITUTION.

A number of the citizens of New-York, impressed with the importance of substituting the inoculation of the vaccine disease for that of the small-pox, lately agreed to associate, and to contribute to the establishment of a public institution for that object. The design of this institution is three-fold; to extend the advantage of vaccine inoculation to the poor—to maintain a permanent supply of genuine matter for the use of the community—and to disseminate a knowledge of this inoculation among the physicians of the adjacent country. After public meetings, held by the contributors for the purpose, they formed and adopted a constitution suited to their design;

and then proceeded, in pursuance of the constitution, to elect the officers of the institution, when the following gentlemen were elected:

Directors.

James Watson,	Samuel Bowne,
John Keese,	Robert Bowne,
Samuel L. Mitchill,	Isaac Hicks,
Gilbert Aspinwall,	William Moore,
Thomas Buckley,	Samuel Miller,
Willet Seaman,	Andrew Cock,
James Robertson,	

Thomas Franklin, *Treasurer.*
Adrian Hegeman, *Secretary.*

The Directors made choice of the following gentlemen to perform the various duties assigned to their offices by the constitution:

James Watson, *President.*
Gilbert Aspinwall, *Vice-President.*

Medical Board.

Valentine Seaman,	Edward Miller,
Wright Post,	Samuel Borrowe.

Samuel Seofield, *Resident Surgeon.*

The Directors having procured a suitable apartment, and made other necessary arrangements, the Medical Board have commenced inoculation, and are now proceeding in it with every prospect of carrying into effect the benevolent intentions of the founders of the institution.

At the last meeting of the contributors, the following resolution, moved by Mr. Samuel Bowne, was unanimously adopted, viz.

"Resolved, that in testimony of the high estimation in which this meeting of contributors hold the philanthropic and able exertions of EDWARD JENNER, M.D. F.R.S. &c. of London, and BENJAMIN WATERHOUSE, M.D. professor of the practice of physic in the University of Cambridge, in Massachusetts, relative to the inoculation of the Kine-Pock, they are hereby appointed perpetual honorary Directors of this institution."

On the Necessity of establishing a Point of Time *for taking the Vaccine Virus for the Purpose of Inoculation, as a Popular Criterion; in a Letter from —— —— to Dr. Waterhouse, dated Washington, Dec.* 25, 1801.

"Knowing how little capable the people in general are of judging between genuine and spurious matter from their ap-

pearance, or that of the pustule, I endeavoured, in the course of my inoculations at M——, to find some other criterion for their guide. With this view I was very attentive to discover whether there be not *a point of time*, counting from vaccination, when the matter is genuine in all cases. I thought the eight times *twenty-four hours* furnished such a point; I governed myself by it, and it has been followed here successfully by Dr. Gantt: but your experience, so much greater, can inform us whether this rule is a sure one, or whether any other point of time would be still more certain. To the eye of experience this is not necessary; but for popular use it would be all-important; for otherwise the disease degenerates as soon as it gets into their hands, and may produce a fatal security. I think some popular criterion necessary to crown this valuable discovery."

—

THE ANSWER.

"I was forcibly impressed with the necessity of fixing on some point of time, by way of popular guide, when to take the vaccine fluid for the purpose of inoculation, in order to prevent the evils you suggest.

"I know that the perfection of the virus differs somewhat in different subjects; but in the formation of a general rule it is necessary to impose a limitation. Dr. Jenner says, 'I prefer the fifth day, or the sixth, or the seventh, eighth, or (if the efflorescence is not far advanced beyond the margin of the pustule) the ninth day.' But I conceive this is impossible to be discovered with requisite precision on the skin of the African. The criterion of LIMPID *matter* is fallacious: for, in the rising of a vesicle from almost any cause, the scarf-skin separates from the true, and a portion of the *superfluous water* of the blood, and sometimes of the *coagulable lymph*, is found under it. I have known this *limpid* fluid exude in considerable quantity from the vaccine pustule that has been too much irritated by pricking, and exhausted of its *virus*. It gives a shining, glazy appearance to the thread. I know of no writer or practitioner who has made this distinction.

"Were I, then, to fix on a point of time, of all others, as a general or popular rule, I should say EIGHT TIMES TWENTY-FOUR HOURS: this being the result of my own experience.

"BENJAMIN WATERHOUSE.

"*Cambridge, Jan.* 28, 1802."

PREMIUM OF THE CHEMICAL SOCIETY.

The Chemical Society of Philadelphia have appropriated fifty dollars for the purpose of procuring a medal, which is to be presented to any person who shall produce the best specimen of clay found in the United States, and fit for the manufacture of potter's ware.

No attention will be bestowed on clay inferior in quality to that from which the common imported queen's ware is manufactured, or on that which shall not have been found in such a situation and quantity as that it may be obtained and manufactured with convenience and profit.

Any person who shall be acquainted with clay, the exhibition of which may entitle him to be a candidate for the possession of the medal, is requested to deliver a specimen of such clay to one of the corresponding secretaries of the society, before the 1st day of January, 1804.

Together with any specimens of clay, sufficient evidence of its good qualities, and an account of the place and quantity in which it may be found, must be delivered, and every communication on this subject must be accompanied by a sealed note containing the name and residence of the author.

The medal will be adjudicated soon after the date above mentioned.

The Corresponding Secretaries of the Chemical Society for the present year are Dr. John C. Otto, Mr. John Y. Bryant, and the undersigned.

By Order of the Society,

R. HARE, jun.

Philadelphia, February 4, 1802.

PREMIUM OF THE AMERICAN PHILOSOPHICAL SOCIETY.

Mr. I. H. De Magellan, of London, having made a donation, to the American Philosophical Society, of *two hundred guineas*, to be vested in a permanent fund; that the interest arising therefrom may be disposed of, in awarding premiums to the authors of the best discoveries or most useful improvements relating to Navigation or to Natural Philosophy, mere Natural History only excepted. The following are the rules and conditions, adopted by the society, for the disposition of the proposed premiums, in conformity to the intention of the Donor, viz.

1. The candidate shall send his discovery, invention or improvement, addressed to the President or one of the Vice-Presidents of the society, free of postage or other charges; and shall

distinguish his performance by some motto, device or other signature, at his pleasure. Together with his discovery, invention or improvement, he shall also send a sealed letter, containing the same motto, device or signature, and subscribed with the real name and place of residence of the author.

2. Persons of any nation, sect, or denomination whatever, shall be admitted as candidates for this premium.

3. No discovery, invention or improvement shall be entitled to this premium, which hath been already published, or for which the author hath been publicly rewarded elsewhere.

4. The candidate shall communicate his discovery, invention or improvement, either in the English, French, German, or Latin language.

5. All such communications shall be publicly read or exhibited to the society, at some stated meeting, not less than one month previous to the day of adjudication, and shall at all times be open to the inspection of such members as shall desire it. But no member shall carry home with him the communication, description or model, except the officer to whom it shall be entrusted: nor shall such officer part with the same out of his custody, without a special order of the society for that purpose.

6. The society having previously referred the several communications, from candidates for the premium then depending, to the consideration of the twelve counsellors and other officers of the society, and having received their report thereon, shall, at one of their stated meetings, in the month of December, annually, after the expiration of this current year (of the time and place, together with the particular occasion of which meeting, due notice shall be previously given, by public advertisement) proceed to the final adjudication of the said premium: and after due consideration had, a vote shall first be taken on this question, viz. "Whether any of the communications then under inspection be worthy of the proposed premium?" If this question be determined in the *negative*, the whole business shall be deferred till another year; but if in the *affirmative*, the society shall proceed to determine, by ballot, given by the members at large, the discovery, invention or improvement most useful and worthy: and that discovery, invention or improvement which shall be found to have a majority of concurring votes in its favour, shall be successful. And then, *and not till then*, the sealed letter accompanying the crowned performance, shall be opened, and the name of the author announced as the person entitled to the said premium.

7. No member of the society who is a candidate for the premium then depending, or who hath not previously declared to the society, either by word or writing, that he has considered and weighed, according to the best of his judgment, the comparative merits of the several claims then under consideration, shall sit in judgment, or give his vote in awarding the said premium.

8. A full account of the crowned subject shall be published by the society as soon as may be after the adjudication, either in a separate publication, or in the next succeeding volume of their transactions, or in both.

9. The unsuccessful performances shall remain under consideration, and their authors be considered as candidates for the premium, for *five* years next succeeding the time of their presentment; except such performances as their authors may, in the mean time, think fit to withdraw: And the society shall annually publish an abstract of the titles, object or subject matter of the communications so under consideration, such only excepted as the society shall think not worthy of public notice.

10. The letters containing the names of authors whose performances shall be rejected, or which shall be found unsuccessful after a trial of five years, shall be burnt before the society without breaking the seals.

11. In case there should be a failure, in any year, of any communication worthy of the proposed premium, there will then be two premiums to be awarded in the next year. But no accumulation of premiums shall entitle an author to more than one premium for any one discovery, invention, or improvement.

12. The premium shall consist of an oval plate of solid standard gold, of the value of *ten Guineas*. On one side thereof shall be neatly engraved a short Latin motto suited to the occasion—together with these words, *The premium of* I. H. De Magellan, *of London, established in the year* 1786; and on the other side of the plate shall be engraved these words, *Awarded by the A. P. S. to* ——— ———, *for his discovery of* ——— ——— *A. D.* ——— ———, *President.* And the seal of the society shall be annexed to the said golden plate, by a ribbon passing through a small hole near the lower edge thereof.

MEDICAL SOCIETY OF NORTH-CAROLINA.

Raleigh, December 8.

On Tuesday last, the Medical Society of North-Carolina met in this city, and adjourned on Thursday evening. A con-

siderable number of respectable Physicians from various parts of the State were present. At the opening of the society, the President delivered an Address, in which a cursory narration of the progress of the Science of Medicine from the earliest ages was given, and the most eligible means of promoting its utility in this country were pointed out. Various subjects of Medical Science were discussed.—An ingenious practical Treatise on general Dropsy was read by Doctor Wheaton, in which a successful method of treating that formidable disease was illustrated by relations of particular cases.

The society resolved on attempting to make a collection of such of the indigenous productions of the United States as may be found to have medical properties; a member of the society is appointed to superintend their cultivation and preserve them for a Botanic Garden, which they are taking measures to establish at the place of their annual meetings.

In consequence of the invitation given by the Society at their last annual meeting, and the encouragement offered, several medicinal articles have been cultivated in different places in the State with advantage, but not in such quantities as to entitle any person to a premium. The partial success of these trials has induced the society to continue the offer of the premiums for the following year.

A committee of three members is appointed to devise and report to the next convention of the society, a plan for the establishment of a Library, and the collection of a Museum of Anatomical preparations, and such other Curiosities of Nature and Art as may be deemed worthy of preservation by the Physician or Naturalist.

Four members are appointed to present Dissertations to the next annual meeting.

The best mode of preventing and curing Infantile Diseases is given as a prize subject for the ensuing year.

The Officers elected for the year 1802 are Doctors John C. Osborn, President; Thomas Mitchell and Richard Fenner, Vice-Presidents; James Webb and John Claiborn, Censors; Calvin Jones, Corresponding-Secretary; Starling Wheaton, Recording-Secretary; and Cargil Massenburg, Treasurer.

AMERICAN PHILOSOPHICAL SOCIETY.

Philosophical Hall, Philadelphia, Jan. 1, 1802.

The following persons were duly elected officers of the American Philosophical Society, held at Philadelphia:

Thomas Jefferson, *President.*

Robert Patterson,
Caspar Wistar,
Benjamin Smith Barton, } *Vice-Presidents.*
John Redman Coxe,
Adam Seybert,
Thomas C. James,
Joseph Clay, } *Secretaries.*
James Woodhouse,
John Bleakly,
B. H. Latrobe,
Samuel Duffield, } *Counsellors for three years.*
C. W. Peale,
John R. Smith,
Robert Leslie, } *Curators.*
John Vaughan, *Treasurer.*

AGRICULTURAL SOCIETY OF THE STATE OF NEW-YORK.

The Agricultural Society of the State of New-York held their annual meeting at Albany, on Wednesday evening, the 17th February, 1802, for the election of officers, when the following gentlemen were chosen:

Robert R. Livingston, Esq. *President.*
Ezra L'Hommedieu, Esq. *Vice-President.*
John Tayler, Esq. *Treasurer.*
Dr. Samuel L. Mitchill,
Dr. Benjamin De Witt, } *Secretaries.*
John Lansing, jun. Esq.
Stephen Van Rensselaer, Esq.
Simeon De Witt, Esq.
Stephen Lush, Esq.
Rev. John B. Johnson, } *Committee of Publication.*

MEDICAL SOCIETY OF SOUTH-CAROLINA.

At the anniversary meeting of the Medical Society, held in Charleston, on the 24th of December, 1801, at the house of Mr. W. P. Young, the following gentlemen were elected officers for the ensuing year:

Samuel Wilson, M. D. *President.*
James Moultrie, M. D. *Vice-President.*
Edward D. Smith, M. D. *Secretary.*
Dr. Joseph H. Ramsay, *Treasurer.*

BILL OF MORTALITY FOR PORTSMOUTH, NEW-HAMPSHIRE, FOR A. D. 1801. *By Lyman Spalding, M. B. &c.*

Disease.	*Age.*	No.
Aphtha.	3 Weeks.	1
Apoplexy.	39 Years.	1
Atrophy.	3 Weeks. 50, 3 Years. 4 Months. 55 Years.	5
Cancer.	65, 76 Years.	2
Cholera Infantum.	6 to 18 Months.	7
Consumption.	54.50.56.75.44.35.27.83.65.69. 56.50.60.44.32.55.26.40.48.32.	20
Debauchery.	25, 29 Years.	2
Dropsy.	28, 41 Years.	2
Dropsy in the brain.	12 Months.	1
Epilepsy.	4 Weeks. 10 Years. 8 Weeks.	3
Fever, Bilious	26. 30—45—18. 28—18. 14—64—8. 33.	10
Fever, Pulmonic.	12 Days. 15, 21, 84 Years.	4
Hooping-Cough.	3 Months to 4 Years.	11
Iliac Passion.	95 Years.	1
Mortification.	60 Years.	1
Nephritis.	74, 66 Years.	2
Old Age.	82, 99, 75, 76, 80 Years.	5
Palsy.	54. 42—68. 64—77. 46. 64—64. 43—60. 19. 80.	12
Phrenitis.	31 Years.	1
Scrophula.	8 Years.	1
Still Born.		1
Casualties. Burnt.	71 Years.	1
Drowned.	60, 18, 45 Years.	3
Fall.	17 Years.	1
Frozen.	38 Years.	1
Poison by Opium.	6 Months.	1
	Total.	100

Portsmouth, situated 43d. 5m. north, 70d. 41m. west from London, contains 5511 inhabitants. The town has been very healthful, not one in fifty-five having died. A bilious remitting fever prevailed the whole year; which, in several instances, in September and October, manifested the malignant type. From June to October, the cholera infantum was prevalent. From September to the end of the year, the hooping-cough was endemic; very few children escaped it. A fifth part have died of phthisis pulmonalis! "IS THERE NO BALM IN GILEAD? IS THERE NO PHYSICIAN THERE?"

MEDICAL PUBLICATIONS.

We are glad to find that Professor Barton, of Philadelphia, has just published a second edition of his "Collections for an Essay towards a Materia Medica of the United States."

Dr. Caldwell, of Philadelphia, has published "An Oration on the Causes of the Difference in point of Frequency and Force, between the Endemic Diseases of the United States of America, and those of the Countries of Europe; delivered by appointment, to the Philadelphia Medical Society."

An "Annual Oration, delivered before the Chemical Society of Philadelphia," by Dr. Felix Pascalis, has just issued from the press.

We lately received from Jamaica, transmitted by the author to Dr. Mitchill, "The Medical Assistant, or Jamaica Practice of Physic; designed chiefly for the Use of Families and Plantations. By Thomas Dancer, M. D. late Physician to the Bath, and Island Botanist."

Dr. John Vaughan, of Wilmington, State of Delaware, re-published, some months ago, "The Female Monitor, consisting of a Series of Letters to Married Women on Nursing and the Management of Children. By the late Hugh Smith, M. D." To this work of Dr. Smith, Dr. Vaughan has added many occasional notes, together with a Compendium of the diseases of infants, by way of appendix.

A more particular account of these several publications will be given hereafter.

Dr. Waterhouse, of Cambridge (Mass.), intends soon to publish a tract, entitled "Practical Observations on the Local Appearance, Symptoms and Mode of treating the Kine-Pock."

MEDICAL BIOGRAPHY.

Short Account of the late Dr. Shippen, of Philadelphia, father of Professor Shippen, of the University of Pennsylvania: written by one of the grand-daughters of the deceased.

IT has been an approved custom for many ages, in all enlightened and civilized countries, to perpetuate, as far as possible, the characters and virtues of deceased friends, in order to compensate in that way the loss sustained by their removal from the world, and to transmit a knowledge of their worth for the imitation and benefit of posterity.

There has seldom occurred an instance in which there was more reason to perpetuate the virtues of an active and useful

life, than in the case of Dr. William Shippen, sen. who departed this life November 4th, 1801.

This worthy and excellent man was descended from one of the most ancient and respectable English families, which migrated to this country on account of religious persecution, first to Massachusetts, and then for the same cause to Pennsylvania, soon after its settlement by William Penn. He was born in Philadelphia, on the first of October, in the year of our Lord 1712. He applied himself early in life to the study of medicine, for which he had a remarkable genius. He possessed that kind of intuitive knowledge of diseases which cannot be acquired from books. In his practice he was uncommonly successful, by which means he soon rose to very high reputation and extensive business, which he retained to an advanced age: But, in his long journey through life, his useful labours were not confined to the duties of his profession.

He was the friend of learning. He was one of the founders of the College of New-Jersey, towards the establishment of which he contributed very largely, and was, for the greatest part of his life, one of its trustees: he has left it a considerable annuity for ever. He was also one of the trustees of the College of Philadelphia; and a member of the Philosophical Society, and, at one time, its Vice-President. He was the friend of Dr. Franklin. He was attentive to all public institutions; the Pennsylvania Hospital in particular is much indebted to him: he was the first physician who offered his voluntary attendance there, and, during many years, was its constant benefactor as well as one of its physicians; he also assisted at its foundation.

He was the friend of liberty and of his country. At an advanced age he was appointed a member of the Congress of the United States, in which station he proved himself an enlightened, well-informed patriot. He continued to rejoice in the prosperity of his country in the evening of his life, and was a decided advocate for the principles and form of the republican constitution of the United States.

He was the benefactor of the poor of every denomination, and at all times yielded to their calls, without compensation, as a physician. From his well-known ability and integrity, he was left guardian to many estates of the widow and orphan, to the poor of which class he has left a handsome legacy in his will.

But what is still more to his honour, he was the friend of religion. His hospitable doors were always open to the ministers of the gospel. He enjoyed a large share of the friend-

ship and confidence of the celebrated Mr. Whitefield. He was well acquainted with all the different systems of divinity, but was most strongly attached to that which was so ably defended by Mr. Edwards, one of the Presidents of the College of New-Jersey. He was also one of the founders of the first Presbyterian church of the city of Philadelphia, of which he was a member near seventy years. As a proof of the influence of the religion he loved, upon his conduct, it is worthy of notice, that in the whole course of his long life he never was once heard to swear profanely, nor to take his Maker's name in vain.

In private life he was the tender husband, affectionate parent, and kind master. To his family, in all its extensive branches, he was kind and attentive, and to all he was strictly just.

But amidst the bright cluster of his virtues conspicuously shone his humility, modesty, integrity, and truth. His temperance was so great that, until within a few weeks of his death, he never drank wine, nor any other spirituous liquor. He owed his health very much not only to his temperance, but to constant daily exercise. He superintended the business of his farm, and had always the entire management of his large estate, until a few months before he died. In his family he exhibited that simplicity in living which is alike consonant to the principles of christianity and republicanism; even his dress conveyed his ideas of simplicity, for he was opposed to ostentation in every thing. His temper was another remarkable trait in his character: it was uniformly sweet, as well as forbearing, forgiving, cheerful and serene. He had so much of the vivacity of youth, that, between eighty and ninety years of age, he often witnessed their pleasures when innocent, and even sometimes partook of them. His benevolence was so universal, that it may very justly be said of him, that he wished well to the whole human race.

He lived beloved, and at the great age of ninety years within some months, he bowed his reverend head to the will of his merciful Creator, amidst his numerous descendants, regretted and lamented, and was buried in the grave-yard of the church to which he had been so useful (by the side of six of his grandchildren), followed by a large train of his mourning relatives and friends.

CORRESPONDENCE.

To the Editors of the Medical Repository.

GENTLEMEN,

BY perusing the Monthly Magazine and American Review for December, 1800, and the Medical Repository for November and December, 1800, and January, 1801, I find that my little treatise on the Physical Principles of Astronomy, appears to have been examined in a very cursory manner; and introduced to the public with an intimation, that a number of the fundamental principles have been gratuitously assumed without proof, and consequently are to be considered as mere matter of conjecture. As I presume you are acquainted with the reviewers, I must request you to be so obliging as to present the following comment to them, with my respectful compliments; and if it is consistent with your plan, I wish to have it inserted in the Medical Repository, together with whatever farther animadversions the reviewers may please to make: the more particular and critical they are in scrutinizing my principles, and endeavouring to show, that the electrical and other experiments which I have adduced, are not pertinent, and do neither elucidate nor corroborate my hypothesis, the more I shall be gratified. If this mode had been pursued at first, the review might have been more perfect; but unfortunately they spent too much time in detailing a system, from which they conjectured I had stolen (at least) the outlines of mine; whereas I had never heard the name of Mr. Hutchinson mentioned as an author until my hypothesis was formed, nor have I ever seen any thing but extracts from his works until this hour. I formed my system chiefly from observation, and reasoning analytically upon the facts and appearances that were discoverable by the senses, and by reading Dr. Priestley's History of Electricity, and trying a number of electrical experiments. I saw that the sun was continually emitting oceans of fire, which are diffused throughout the regions of space; and was told that this had been continued for more than six thousand years: I therefore compared the *sun*, as the reservoir of *fire*, to the *sea*, as the reservoir of *water*, and concluded they were both indestructible: I saw the water which evaporated from the surface of the ocean was conveyed back to its common receptacle, by springs,

rivers, &c. otherwise the sea would have been greatly exhausted by this time: I therefore concluded, that there was the same necessity that the fire should flow back to its common receptacle, that there was for the return of the water; otherwise the pabulum which supplies the sun would have been greatly diminished; and although it returns in a more condensed state, and with less apparent velocity, than the rays of light issue from the sun, yet it is certain that an equal quantity does return in equal times; which, by its rapid current, weight and spring, must produce an equal or rather more powerful effect on the sides of the planets that are opposite to the sun, than were produced by the elastic repulsive action of his rays on the atmospheres of the planets in going out: I say more powerful, because the appulsive influence has to overcome the centrifugal force of the planets, which must be very great.

But here I must observe, that as it is pure elementary fire which is sent forth from the sun, in diverging rays, when converged to a focus by a good burning glass, will flux the most refractory metals in a few seconds: when this indestructible element is returned to the sun in converging lines, it only requires the same degree of heat and agitation to be repeated, to cause it to resume its pristine qualities, of generating light, heat and motion. A consideration of these facts caused me to wonder that people should search for and expect to find the cause of motion in solid inert matter; and conclude, "that all matter gravitates to all matter;" when they could discover no such quality in it, but, on the contrary, a strong negative power to resist motion and remain at rest; and also saw motion in all cases communicated to inanimate matter by fluids. I soon perceived that all the motions in our atmosphere, from the most gentle breeze to the most violent storm, were caused by the alternations of heat and cold changing the equilibrium of the air: when the earth and its atmosphere are greatly heated in one place, by the rays of the sun, while the air is cooled and condensed in the vicinity, by the intervention of clouds, the cold dense air flows in, and displaces that which was rarefied, with a degree of velocity proportioned to the difference of temperature, until the balance is restored; that is, until the air has acquired an equal degree of heat or cold; and then a calm ensues. If this doctrine required any farther illustration, we have it in a discovery made by the celebrated Dr. Franklin: while he was a printer in the city of Philadelphia, there happened a violent north-east storm: in a few days after he received the papers from Georgia, the middle States, and from

Boston; and by comparing the accounts given in them, he discovered that the storm commenced in Georgia, after the air had been greatly heated, and retrograded regularly, until it arrived at Boston, several hours after it began in Georgia.—"Pray, Sir, (says a grave Newtonian) what do you mean to prove by this minute detail of facts, that are known to almost every school-boy?" I mean, in the first place, to intimate, that much of our ignorance is owing to our neglect to arrange and combine simple facts, which, when judiciously systematized, constitute the essence of all our useful knowledge.

I mean, in the next place, to prove, that the sun is the common source and dispenser of fire in our system; that this fire, by heating and rarefying the atmospheres of the planets and their satellites, renders them very elastic and strongly repulsive, by which means they act with great power upon their sides, that are continually presenting a new surface to the sun: while that part of their atmospheres which lies behind them in long dark cones, being deprived of the influence of the solar rays, is cooled, condensed, and rendered more weighty, and will, in consequence, press forward with a force and velocity proportioned to the different degrees of rarefaction and condensation of the atmospheres on their different sides; for if a cloud, intercepting the rays of the sun for an hour in one place, while they are heating the atmosphere in the vicinity, can condense it in one place and rarefy it in another, to a degree sufficient to produce a most violent wind, surely the interception of the body of the earth for many hours must produce a much greater effect.

Newtonian. "Were this doctrine true, we should have a constant rapid wind from the *westward*." This certainly would be the case, if the earth did not progress with as great celerity as its atmosphere: but although it moves at the rate of 68000 miles every hour in its annual revolution, it glides along in its own atmosphere like a balloon, or a vessel floating with the tide: and if the earth moved with more celerity than its atmosphere, we should have a constant wind from the *eastward*. It is therefore evident, that if the earth should be suddenly stopped in its course, the current of its atmosphere would sweep every moveable substance on its surface to the *eastward*, as its atmosphere would continue to move at the rate of 1133 miles every minute.

Probably I may be told that this is a feeble attempt to revive the long exploded vortices of Descartes. As I freely confess my entire ignorance of the arguments adduced by Descartes,

in support of his hypothesis, or those of his opponents, to invalidate them, I will thank the reviewers for candid answers to the following questions, viz.

Query 1st. If the earth moves at the rate of 68000 miles every hour in its annual revolution, and revolves on its axis once in every 24 hours; if its atmosphere does not keep pace with both these motions; why have we not a constant rapid current of wind from the eastward?

Query 2d. If it must be granted that the atmosphere of the earth is impelled, by the powers above mentioned, to move from west to east at the rate of 68000 miles every hour, and also to progress with the surface of the earth in its diurnal revolution; in what particular circumstance do these *circular motions* differ from a *vortical revolution?*

Query 3d. Must not this amazingly rapid vortical current, acting agreeably to the laws of matter in motion, exert a strong appulsive power on the side of the earth opposite to the sun?

Query 4th. If the earth and its atmosphere move with equal celerity, is it not evident that it is sustained by and wafted along in the current of its own atmosphere, like a balloon, or a ship sailing down a rapid current with a fair wind?

It has been suggested that I have assumed some fundamental principles without proof: I freely confess that there are some phenomena in astronomy which oblige us to have recourse to analogy: but I have endeavoured to confine myself to a rule similar to that which Pope prescribed to himself in his Essay on Man:

> " Say, first of heav'n above or earth below,
> " What can we reason but from what we know?"
> We see that power and motion every where
> Are caus'd by fire or water, gas or air:
> We also see all heavy bodies tend
> To earth, where all factitious motions end:
> Stones neither fly nor leap, nor walk nor crawl,
> But must be raised by art before they fall.
> Were gravitation nature's only law,
> And matter did all other matter draw,
> Comets and planets instantly would run
> Into one mass, and overwhelm the sun.

The first pointed objection made by the reviewers to my Physical System, is contained in page 441 of the Monthly Magazine and American Review, for December, 1800, respecting the extensive sphere of action assigned to the electric fluid, which I have supposed to be co-extensive with our solar system, and the secondary cause of all motion. This assump-

tion, as it is called, is founded upon a certain knowledge, that the electric fluid is the most energetic modification of fire; and that fire is continually emitted by the sun, in rays which pervade the whole system, and by their perpetual conflict with frost, do generate light, heat, life, and motion of all kinds. Many experiments and observations evince, that this fluid is not only more abundant, but more active in the superior regions than below; such as the aurora borealis, meteors, the tails of comets, &c. But if the reviewers, or any other person, will produce one single instance in which motion has been generated without the immediate or remote action of some modification of fire, I will acknowledge that I have assumed too much.

If any person should offer the action of the magnetic effluvia as an exception to this general rule, I stand ready to prove, by actual experiment, the magnetic to be a modification of the electric fluid, which is itself a modification of fire. But in the grand operations of our solar system, it requires a perpetual conflict between heat and cold to produce and perpetuate motion.

I confess that the second assumption, respecting the internal structure of the sun, is only supported by analogical reasoning, from what *we know*, to a case in which no experiment could be made, on account of the *distance* and *heat* of the *climate*.

Copernicus had ascertained the fact that the planets did revolve round the sun; but it remained for the physical astronomer to investigate and explain the cause of these revolutions. Sir Isaac Newton attempted to do this, but, I conceive, without success. And the reviewers contend that it is not necessary that the efficient cause of gravitation should be made known, although gravitation appears to be the basis of their system.

The third article they object to respects the repulsive influence ascribed to the atmosphere of the sun, and its appulsive force in returning. With respect to the sun's repulsive action, it consists in a two-fold operation, to wit, the impulsive influence of its rays, and the sudden rarefaction of the vaporous atmosphere of our earth, on the side successively presented to his rays, which is known to act with an expansive and repulsive power, proportioned to the degree of heat communicated in a given time. With respect to the powers of appulsion, every fluid in nature declares it to be an invariable law, that there shall be no *vacuum;* for, while the sun is sending forth the rarefied pabulum by which he is supplied, an equal quantity must return in equal times, or the equilibrium of the system

could not be maintained; the sun would soon be extinct, and light, heat, life, and motion be no more. If this igneous matter returns in a condensed state, as fast as it is emitted from the sun, it certainly must exert very strong appulsive powers upon the sides of the planets that are opposite to the sun, while it is returning with such amazing velocity. For if the disparity in the weight and spring of the air on our earth, caused by the different degrees of heat and cold, can create such surprizing currents of air as we frequently experience, we should naturally expect much greater effects where rarefaction and condensation are produced in the most extreme degree.

The question may be asked, If the air moves with such amazing velocity from west to east, why do we not feel its force and perceive its effects? The reason is obvious; because the earth and its atmosphere move in the same direction, with equal velocity.

Were a balloon to be raised when the air was perfectly calm, and should remain stationary directly over the point from whence it was raised, is it not demonstrably evident, that, to keep pace with that point of the earth, it must move at the rate of 68000 miles every hour, although it apparently stood still, and the person seated in the car would feel no impulse of the air? Can it be necessary to tell even the most dull of comprehension, that if the balloon did really stand still, it would apparently move to the westward at the rate of 68000 miles every hour?

If my opponents should still dispute the existence of this rapid appulsive atmospheric current, let them first invalidate the force of the evidence already offered, and candidly answer the preceding questions relative to this subject: I will then consider their objections attentively, and answer them if I can.

The reviewers charge me with having censured gravitation, as an occult quality of matter, contrived to hide our ignorance. I candidly confess that I have ridiculed the idea of *attraction* as a most palpable absurdity, in all cases wherein one mass of solid matter has been supposed to draw another at a distance towards it, where there was no other connecting medium than fluid air, or a perfect vacuum; for I had long since relinquished the idea of the possibility of matter acting where it was not present. But that I ever censured *gravitation* as a fictitious quality of matter, is a mistake, caused by the ambiguity of the technical terms made use of by the Newtonians, which are so indefinite as to bear many different constructions, as appears by their own definition, to wit: "This law may be variously

" denominated: when referred to the earth, it may be called " gravitation; when exerted in the planets, centripetal force; " and when in the sun, the centre of our system, it is named " attraction: we may therefore understand and interpret this " law in various ways, either as an attractive power exerted " by the sun, as an appetence or tendency in each planet, or " as a force external to both the sun and the planets, impelling " them to the sun, the impulse of a stream of fluid, and even " the electric if preferred to any other, moving continually " towards the sun." For the reviewers say, " It is not neces- " sary to the truth of the Newtonian theory, that the material " or efficient cause of gravitation should be made known; it " is sufficient (they say) to prove the existence of such a force " directed towards the sun."

But were we, for argument sake, to grant the existence of these assumed principles, and the full operation of all the powers they could possibly exert, agreeably to the laws assigned to them by Sir Isaac Newton, what would the result be? Would not attraction bring the planet in a direct line into the sun? It surely would, had not the Newtonians provided a projectile power to counteract this tendency, and prevent such a fatal catastrophe. But would not this projectile force soon be weakened, and at length quite destroyed, in passing through a resisting medium? Experience evinces this to be the invariable law by which projectiles are governed; but to obviate this difficulty they have also assumed a very extensive *vacuum*, in which the planets move, and meet with no resistance. They also allege that the attractive influence of the sun increases according to the squares of the distance of the planets from the sun, and that this influence diminishes in the same ratio as the planet to be acted upon is removed to a greater distance.

Now, if we allow the combined operation of all these assumed powers, and the provision of a perfect vacuum to facilitate their action, and also suppose the powers of attraction and projection exactly balanced, the only permanent revolution they could possibly produce would be perfectly *circular*, but could never produce and continue an elliptical revolution; because the very moment the planet should fall within the circular line, the attractive and gravitating influence would be gaining, and the projectile losing power, according to the squares of the distance, which would produce a spiral revolution, and soon bring the planet into the sun. It is also demonstrably evident, that from the time the planet should pass the line, where attraction and projection were equal in power,

the attractive and gravitating influence must be decreasing, and the projectile force increasing, every moment, according to the squares of the distance. What influence would then remain to bring the earth back to the line where attraction and projection are equally balanced? The Newtonians tell us, that the earth goes on receding from the sun until its projectile force is almost spent, or greatly weakened; that then gravitation begins to gain the ascendency, and brings it back again! But I request them seriously and candidly to answer the following question, agreeably to their own principles, to wit: What can weaken, impair or destroy the force of a projectile, moving at the rate of 68000 miles every hour, through a perfect vacuum or unresisting medium, when the only obstacle to its progress is every moment decreasing in power, according to the squares of the distance?

If satisfactory answers cannot be given to these questions, I think it probable that I will not long remain the only heretic who will dispute the orthodoxy, and doubt the permanency of Sir Isaac's physical principles of astronomy, and question their legitimate claim to immortality.

The Newtonians allow that the earth recedes 3,235,882 miles farther from the sun at one time of the year than at another. If, therefore, they cannot prove that attraction and gravitation exert their greatest influence when the bodies to be acted upon are at the greatest distance from each other, they will be obliged to relinquish the doctrine of attraction, and embrace that of appulsion, or assume some other adequate power, to bring the earth back to the line where attraction and projection are supposed to be equally balanced. The reviewers complain, and I confess not without some reason, that I have not exhibited my opinions with sufficient minuteness of detail: for this omission I could assign many reasons; but the following may suffice, viz. While I followed the practice of physic I had very little leisure, and seldom wrote half a page at one time; and when I quit the practice I was deterred from writing by a fall which injured my breast: I had therefore determined not to publish my treatise in such an imperfect condition, until I was solicited by some of my friends to endeavour to fit it for the press; but after transcribing and correcting a few sheets, I was obliged, through indisposition, to quit it, and even suppressed some parts which I did not deem sufficiently correct. I flattered myself that my sentiments, as far as they were communicated, would be intelligible to some persons conversant in astronomy, who might improve

and explain my theory to more advantage than I have done; but if they differed in sentiment from me, I expected they would state their objections fairly, and show my errors in the strongest light, as nothing could give me much more pleasure than to see a judicious, candid Newtonian, seated to analize my principles, and endeavour to demonstrate, that the experiments exhibited in the 15th, 16th, and 17th pages of the treatise, are not calculated to explain and establish the doctrine of repulsion and appulsion; and that what I have observed respecting the direction of the tails of comets, in their revolutions, is no evidence of the repulsive power of the solar rays. And when this is done, they may proceed to prove, that the glass tube mentioned in the 33d page of the treatise, was drawn up the ascent, and caused to revolve on its axis, by the *attractive* influence of the *fire*, and not by the appulsive influence of the cold dense *air* flowing in behind the tube, to displace the rarefied air in the fire-place. And as my theory rests essentially upon this position for its basis, viz. that fire, in its various modifications, is the physical cause of all motion, it would be the most effectual method to invalidate the whole system, to prove that motion can be generated and propagated independently of fire or any of its modifications. The only article in my system which rests entirely upon analogy, is my conjecture respecting the internal structure of the sun; and the only article in the Newtonian physical system that is founded in fact, upon any real property of matter, is *gravitation:* all the others, to wit, attraction, projection, and a supposed extensive vacuum, are all gratuitous assumptions, not only without proof, but contrary to analogy and daily experience. Ten yoke of oxen could not draw ten pounds one inch out of its place, with no other connecting medium between them and the load than fluid air. Neither would the apple have fallen from the tree, which gave Sir Isaac the first hint that gravitation was one principal cause of the celestial motions, had not the tree been raised to a considerable height, and the apple nourished by juices sent thither by the active influence of the solar rays: and daily experience shows us, that all projectiles move in curve lines until they fall to the earth, where they rest.—With respect to an extensive *vacuum,* it is contrary to the evidence of our senses, and should never have been introduced into physics. But, fictitious as these powers are, and the laws by which they are supposed to be governed, if we should grant their existence, and concede to them all the effects they could possibly produce, agreeably to the laws

assigned to them by Sir Isaac Newton, I conceive I have demonstrated that they could not possibly produce and continue an elliptical revolution. Whoever will consider the vast bulk of Saturn, his immense distance from the sun, the prodigious degree of velocity with which he moves in his orbit, which exceeds 22000 miles every hour, and estimate the astonishing centrifugal force this rapid motion must produce, and compare it with the Newtonian ratio of the diminution of the attractive influence of the sun, must be convinced that he would have deserted our system long since, had there not been some more powerful bond of union to restrain him than his greatly diminished attractive influence.

The reviewers ask, "If the sun, constructed in an appropriate manner, emits vast quantities of electric fire to impel the planets in their revolutions round his orb, how does the earth impel the moon, in a manner altogether analogous, though possessing no similarity of structure, for the purpose of accomplishing such an impulse?" I have endeavoured to prove that the sun is the *primum mobile* in our system; that by the penetrating activity of his rays he warms, agitates, and excites into action the atmospheres of his planets and their satellites, which are less or more electrical in proportion to their bulk and distance from the sun; by which means they act reciprocally upon each other by the powers of repulsion and appulsion. Although two cork balls have no similarity of structure to either the globe or prime conductor of the electric machine, yet when they receive the fluid from them they will actuate each other by the powers of repulsion and appulsion which have been communicated to them. In a similar manner the moon actuates the tides in our seas, by a powerful repulsive influence, when she arrives at the meridian; propelling the water in the Atlantic ocean, from the equator, northward and southward, raising high tides towards the poles, and none at the equator, in the Atlantic.

There are but few phenomena in nature more evident than that the moon is actuated both by the sun and the earth, by which means her motions are sometimes accelerated, and at others retarded; and as the direction of their compound influence is varying in almost every point of her orbit, she is caused to deviate from any constant track in her erratic revolution. Besides, it is evident that the moon is accelerated in her course by the vortical current of the earth's atmosphere, as she does not only keep pace with the earth in her annual revolution, but circulates round it once in every month.

It is a remarkable fact, that whenever frivolous objections have been made to Sir Isaac's physical system, they have been immediately answered, while those of the greatest importance are either entirely neglected, or treated with ill humour. The authors of the Encyclopædia, fol. 781, observe, that " as to the " power of *gravitation* and *projection*, which Sir Isaac New- " ton assumed as the cause of the planetary revolutions, it is of " the utmost importance to the physical astronomer to be as- " certained, whether these forces are capable of producing the " effects ascribed to them. Objections similar to those in- " serted have been published long ago, and we are surprized " that no plain and direct answer hath yet been given to them. " In 1762, a book entitled the Principles of Natural Philoso- " phy, &c. by William Jones, made its appearance, in which, " among other things, the author undertook to prove, that " by a combination of gravitation and projectile force no last- " ing motion could be produced. As far as we know, no " answer has been published to this treatise; and upon looking " into the Monthly Review, vol. 27, we were surprized to find " the author censured rather uncandidly for controverting Sir " Isaac's opinion, while not a word is offered in answer to his " objections, or a hint given where such a thing could be " found: in other respects the reviewers own, that Sir Isaac " himself has reasoned very weakly and inconclusively in phy- " sical matters. In 1764, another treatise of the same nature, " entitled Short Observations on the Principles and moving " Powers assumed by the Present System of Philosophy, was " published. In this the whole physical part of Sir Isaac's system " was attacked, and even ridiculed. The author asserted the " insufficiency of the two forces of gravitation and projection " to keep a planet in its orbit, and if no other power than these " acted upon it, that it behoved to be hurried off in an eccen- " tric curve. Being unacquainted with any answer to this " treatise, we were obliged again to have recourse to the " Review for 1764. We found the following answer, viz. " that the argument is fallacious, because he does not take into " consideration the time in which gravity acts on moving " bodies. Certainly an objection of such a capital nature as " this merited a more particular answer, or a direction to some " other treatise where such an answer might be found. It is " in a manner incredible, that such an excellent mathematician " as Sir Isaac Newton should have assumed two powers, as " first principles, which were utterly insufficient to produce " the effect he ascribed to them; and on the other hand, if

" they are sufficient, we are entirely at a loss to account for " the want of replies to such objections in the common astro- " nomical treatises, when others of at least as little conse- " quence are fully obviated." Encyclopædia, fol. 781, No. 105; Newtonian physical system overturned by admitting the action of electricity in the heavens. " But further we are " afraid that most philosophers, even the most zealous advo- " cates for Sir Isaac Newton, are inclined to admit the exist- " ence of a power in the celestial regions, which must either " be the cause of the planetary revolutions, or will utterly " destroy their motions: the power we mean is that of elec- " tricity. We have already quoted Dr. Hamilton conjecturing " the tails of comets to be streams of electric matter; and in- " deed their resemblance to the aurora borealis is so great, that " it is almost impossible to ascribe the one to electricity, and " the other to any different cause. But let us attend to the " consequences of this supposition: the tails of comets are " immensely large; Sir Isaac Newton computed that of the " comet in 1680 to be eighty millions of miles in length. " What inconceivable power must not such a stream of elec- " tric matter be attended with? We are sure that by its means " the comet would attract at the distance of 80,000,000 miles, " and how much farther we cannot tell. If we suppose the " sun to be the fountain of electricity, as well as heat and " light, then undoubtedly he must attract and repel by means " of his electric as well as his gravitating power, so that the " law of gravitation must either be an effect of the electrical " power, or behoved to be perpetually interrupted by it. If, " with Henly, Cavallo, and others, we suppose the electric " fluid to be a modification of fire, there is an end of Sir Isaac " Newton's physical system to all intents and purposes."

If there ever was an electrician who disputed that electricity was not a modification of fire, he must also have doubted and disputed the evidence of his own senses. I have never imagined that the electric fluid was sent in rays from the sun; but I have long conceived it to be composed of fire and oxygen gas; and I wish the experiment to be made, by exposing the gas to the rays of the sun, in a close glass vessel, for some hours, and then set the vessel open, almost in contact with the globe or ruber, when the machine is in operation: I also wish the same experiment to be made with the fuming spirit of nitre, and with the strong sulphuric acid, poured into a bowl moistened with water, after it has been exposed to the solar rays. But previous to the application of the gas, I wish the

susceptibility of excitement to be tried, so that if any additional power should be communicated by the gas, it may be estimated.

Having endeavoured to render my system more intelligible, I will close the subject at present, by asking one question for information, viz. If the planets keep the same *course* and *distance* from the sun, and move exactly as *swift* by the powers of repulsion and appulsion as they are supposed to do by projection and attraction, by what means does my hypothesis tend to invalidate the importance of the discovery of Kepler's sublime proportions?

Herewith I send you a figure representing the equator, drawn east and west through the centre of the sun, and shewing the progress of the earth along the ecliptic every month in the year, beginning at the tropic of Capricorn, $23\frac{1}{2}$ degrees south of the solar equator, on the 21st day of June; with its axis always parallel to that of the sun. It crosses the solar equator on the 23d of September, and is then 1,617,941 miles farther from the sun than on the 21st day of June. On the 21st of December it arrives at the tropic of Cancer, $23\frac{1}{2}$ degrees north of the solar equator. And on the 21st day of March the earth crosses the centre of the sun again, and is exactly as far from it as it was on the 23d of September; consequently the sun is in the centre of the elliptical orbit, contrary to Kepler's supposed discovery, that the sun always kept in the lower focus of the elliptical orbit. Compare the 37th to the 40th pages of the treatise, with the 283d page of the 4th volume of the Medical Repository.

The figure also shews that the tides are raised to great heights, to the north and south of the terrestrial equator, by repulsion, and not by attraction at the equator, which certainly would have been the case were the Newtonian hypothesis true: for if the tides were raised by attraction, which is supposed to increase with the squares of the distance, the tides should certainly be higher at the island of Ascension, in the Atlantic, than at Whalebone Point, in north latitude 65 deg. I have shewn the figure of the earth on the line of the solar equator on the 23d day of September and the 21st of March, to shew the influence of the sun and moon in raising high tides by their repulsive action, both on their conjunction and opposition.

I am, Gentlemen, with the most sincere respect,
Your most obedient, humble servant,
JOSEPH YOUNG.

New-York, Dover-street, Nov. 28, 1801.

To the Editors of the Medical Repository.

GENTLEMEN,

I HAVE read with much satisfaction the ingenious remarks of Mr. Woodward, in your Review, Med. Rep. vol. 5, page 165, concerning the substance of the sun. The theory appears to be the most rational of any yet published; but I am a little surprized that you have considered that gentleman as the "pioneer" on that subject, after having seen my opinions in the Appendix to the History of Pestilential Diseases. You there find that I have suggested the opinion, that "the sun is the great *electric* of the system," by which I intended precisely the idea which Mr. W. has expressed by "a mass of electron." Hist. of Pest. p. 309. I have also suggested that space is filled with the matter of electron, constituting an atmosphere through which, as a medium, the laws of attraction and repulsion operate, p. 314. And I have gone so far as to intimate that the phenomena of tides, and of the opposite forces of the sun and moon, manifested by changes of weather, and by earthquakes and volcanic eruptions, in certain positions of these orbs, or at certain hours of the day, may be explained on the two principles of attraction and repulsion, or principles of electricity. I have examined the phenomena of tides with great care, and am collecting facts for a further investigation. From all the facts yet collected, it is more rational to ascribe the tides to repulsion or pressure of the moon on the water or atmosphere, than to attraction: and this seems to be the reason why there are small tides about islands; the water being repelled from east to west, is interrupted by the continents, but can be partially interrupted only by islands; and hence the higher tides are in the latitudes far north and south, the water being driven from the equatorial regions towards those points. Hence all rivers and bays, opening to the east on the eastern sides of the continents, or to the south towards the tropics, have higher tides than rivers and bays on the western sides of continents, and opening to the north—the water being propelled *from* the regions to which the moon is vertical: hence also there can be little tide in the Pacific, within the tropics, because there is no land to impede the current, or indeed in the middle of any great body of water—the tide being only a swell, caused by pressure, and thrown against the land.

Yours,

NOAH WEBSTER.

New-Haven, Dec. 20, 1801.

To the Editors of the Medical Repository.

GENTLEMEN,

I READ in your last number "*Considerations on the substance of the Sun*," by Augustus B. Woodward. The following paragraph determined me to write you this for your next number.

"The author's sentiments, under the fifth and sixth of these heads, are so *original* and curious, that we extract them for the *instruction* of our readers. After reciting the opinions of Newton, Buffon, Bowdoin, Herschell and Darwin, as to the cause of the *centrifugal force* of the planetary bodies, he proceeds thus to offer *his own reasons* for believing that it is owing to a repelling power in the mass of electron of which the sun is composed."

Now, I would observe that Dr. WATERHOUSE has delivered a similar idea, more than fourteen years ago, in his course of lectures on *Natural History* in the *University of Cambridge*, and which, I presume, that others of his pupils can remember as well as myself. Lest any one may object to quoting or referring to an unpublished lecture, I will quote a passage from what Dr. WATERHOUSE has *published*. It is from that gentleman's "*Discourse on Vitality, delivered in the First Church in Boston, 8th June*, 1790, *before the Massachusetts Humane Society*," page 16th (printed by T. & J. Fleet); and then I will leave it to the judgment of your readers to determine whether Mr. Woodward's idea is, strictly speaking, an *original* one, observing at the same time, that Dr. WATERHOUSE never, that I recollect, made use of the term *electron*.

"If it be asked, what is that vivifying something, which, through the medium of the atmosphere, gives this oscillation, or concussion, and continues life? I answer, it is a portion of that subtle *electric* fluid which fills the immense space of the whole universe, pervades all bodies, and actuates every particle of matter. By it the phenomena of magnetism, fire, and light are produced; and on it the various and astonishing phenomena of *vegetation* and *animation* depend. If it be asked farther, *what* and *where* is the *source* of this all-powerful agent? I answer, the SUN is the efficient cause of the motions of this fluid, and the various phenomena of our system are the effects of these motions." And, to enforce this idea on his pupils, the Dr. added this poetical quotation, from the "Seasons" of Thompson:

> ——"Soul of surrounding worlds!
> Without whose quick'ning glance, this cumb'rous earth
> Would be a lifeless mass, inert and dead."

February 1, 1802. P. A.

MEDICAL REPOSITORY.

VOL. V.—No. IV.

ARTICLE I.

NARRATIVE *of* FACTS *concerning the* INOCULATION *of the* KINE-POCK: *Communicated to the Editors by* BENJAMIN WATERHOUSE, *M. D. Fellow of the American Philosophical Society, Academy of Arts and Sciences, Massachusetts Medical, and Royal Medical Society London, Physical and Literary Society at Manchester, Philosophical and Literary Society at Bath, and Professor of the Theory and Practice of Physic in the University of Cambridge, Massachusetts.*

YEAR before last I published a tract, entitled, "*A Prospect of exterminating the Small-Pox; being the History of the Variolæ Vaccinæ, or Kine-Pox, as it appeared in England; with an Account of a Series of Inoculations performed in Massachusetts:*" And this communication is meant to convey to the public a few more particulars on that subject.

It was said in the pamphlet, that on receiving the vaccine virus from Dr. HAYGARTH, I commenced the experiment on my own children, four of whom, with three of my domestics, passed regularly through the distemper; and that they soon after went into the licensed small-pox hospital in this neighbourhood, and all seven of them were inoculated by Dr. Aspinwall, with the matter of the small-pox, but without the least trait of infection. It was also there mentioned, that by the 1st of September I had inoculated about fifty persons, of different ages, sexes and conditions.

By this time the public attention was thoroughly excited, and if we may judge by the very numerous letters I received from all parts of New-England, requesting further information, as well as a supply of matter for carrying on the inoculation, we must conclude that there never was any thing in

the medical annals of our country that ever excited half the speculation. Nor will this appear extraordinary to those who know the peculiar situation and sentiments of this part of the union. The inhabitants of New-England view the small-pox with a peculiar dread; not that they have ever suffered any very remarkably desolating visitation from it, but the disease has been kept at an awful distance by restrictive laws, and still stronger popular impressions; so that in New-England, the most democratical region on the face of the earth, the priest, the magistrate, and the people, have voluntarily submitted to more restrictions, and abridgments of liberty, to secure themselves against this terrific scourge, than any absolute monarch could have enforced. We cannot, therefore, wonder, that to a people thus circumstanced, the annunciation of a mild, safe, pleasant and *non-contagious* substitute for the small-pox, was received with an ardour bordering on enthusiasm.

The very numerous applications at this time for the vaccine virus embarrassed me not a little. Practitioners were not then apprized of the very small quantity obtainable from a *single pustule*. I threw out a cautionary hint on this subject, and begged even my quondam pupils to protract their applications for *matter* until the practice was more firmly established by experiment, and observed that some unsuccessful cases in the beginning deprived *Scotland* of the benefits of the small-pox inoculation for more than twenty years. But the hint was misconstrued, and the mischief I dreaded ensued.

I had been particularly careful to warn my readers that there were some circumstances which, if not critically attended to, would bring the inoculation of this recently-imported distemper into a temporary disrepute. I pointed out, from the writings of Dr. JENNER, the fallacious sources whence a disease merely imitative of the genuine kine-pox might arise. I mentioned that *matter*, though originally possessing the specific virus, but which had suffered a decomposition, either from putrefaction or some other less obvious cause, would produce a SPURIOUS disease. I related that when the pustule, or inoculated part, had degenerated into an ulcer, that the matter taken from it, though it possessed the power of inflaming the arm, and of raising fever in the person to whom it was applied, was nevertheless *incapable of securing the system against the contagion of the small-pox.*

I felt it my duty in *November*, 1800, to acquaint the public, through the medium of the newspaper, that the kine-pox had, in many places, degenerated from its original cha-

racter, and that this deviation appeared to have arisen from the inoculator taking his matter from the pustule *at too late a period.* To give all possible weight to my cautions respecting *spurious* cases, I added this extract from the celebrated Jenner to Dr. Pearson:—"Much caution is therefore necessary in the progress of this inquiry; and this is my grand fear, that the discovery may fall into discredit from a want of that attention in conducting the experiments which the subject requires: for example, a person may conceive he has the cow-pox matter on his lancet, when, in fact, there may be only a little *putrid pus:* with this he inoculates, and excites a disease of some kind, *but not such a one as will prevent the small-pox.* Thus a delusive inference would be drawn, at once hurtful to the cause, and particularly injurious to *me.* However, truth must appear at last."—And lest the reader's attention should not, after all, be sufficiently roused, I added—"Instances of this kind are recorded to have happened in England, where the patients were afterwards inoculated for the small-pox, and *took the disorder.*"

But these repeated cautions were disregarded by the young and sanguine practitioner, who saw nothing but regular cases, little trouble, and great profits.—If those whom it most concerns will not attend to what is written expressly for their information, they must alone be answerable for the consequences. There are cases where ignorance is converted into a crime.

Perceiving that my reiterated warnings were misconceived and misrepresented, and finding some professional gentlemen in the country so wrapt up in ideas of extreme simplicity, that they encouraged women and children to inoculate each other, I ceased from further expressions of that kind, and endeavoured to content myself with predicting the consequences of aiming to walk in a narrow and unfrequented path blindfold.

During this period, viz. the autumn of 1800, a singular traffic was carried on in the article of *kine-pox matter*, by persons not in the least connected with the medical profession —such as stage-drivers, pedlars, and in one instance the sexton of a church! I have known the shirt sleeve of a patient, stiff with the purulent discharge from a foul ulcer, made so by unskilful management, and full three weeks after vaccination, and in which there could have been none of the specific virus—I have known this cut up into small strips, and sold about the country as genuine kine-pox, coming directly from

me. Several hundred people were inoculated with this caustic animal poison, which produced great inflammation, sickness, fever, and in several cases *eruptions*, with a greater disturbance of the system in general than what occurs in the true disease. It is worthy of remark that I could not influence these people to believe that they had not passed through the true disease, and that they were not secure from the small-pox. So true it is that a man need not despair making the common people believe any thing *but* TRUTH! That vagrant quacks should stroll about the country, inoculating for half a dollar a head, and some for less, is not quite so surprizing as that they should, in such a country as ours, find people weak enough to receive it from such hands! This imprudence ought not, however, to be attributed to the common people alone. Many young practitioners come in for a share of it. Not a few of them first inoculated themselves, and then others, without having ever read more than the newspaper publications, and some not even those, and who were looking out for eruptions, and foretelling appearances and symptoms that are never attached to the disease; and if any very disagreeable occurrence arose in the course of this imprudent practice, the odium reverted to me.

At length a very serious occurrence took place, which arrested, in some degree, this blind rage for promiscuous inoculation; and as this incident is much oftener quoted than understood, I shall take some pains to explain it, especially as it has ultimately turned out to the honour of the *Jennerian* discovery and practice.

I had inoculated two inhabitants of *Marblehead*, a considerable sea-port about 16 miles from *Boston*. The one was a young gentleman, Mr. F. a particular connection of Dr. S. The other was a boy of about ten years old, the son of Dr. D. Dr. S. had obtained some matter from the arm of a common sailor who came from London to Marblehead, in a ship of which Dr. S.'s son was an officer. But this matter, which was *supposed* to have been the *cow or kine-pox virus*, was in fact the *variolous* matter, and Dr. S. began the use of it on his own children, which sufficiently proves the parent was imposed on. The consequence was, the small-pox spread through the neighbourhood, and the municipal authority gave leave for a general inoculation. Previously to this sad accident, Dr. D. had inoculated about forty persons from the arm of his son whom I had inoculated, but did not adhere to my directions respecting the *time* of taking the matter, and

ALL *that he inoculated took the small-pox, either casually or by inoculation.* The consequence was, as might have been foretold, a sudden downfall to the credit of the new inoculation, and not a few execrations on the original promoter of it. Although I saw clearly the cause of this disaster (for I repaired immediately to Marblehead, and saw the chain of their calamity, and examined every link of it in conjunction with Dr. S. and Dr. D.), I found it vain to attempt to explain or palliate, but left its developement to time, that infallible test of truth. There was one thing, however, that attracted the attention of a few, namely, that the two persons whom I inoculated escaped the small-pox, although one was an assistant inoculator, and in some instances nurse, during the whole time that disorder was passing through the town; and the other slept with his brother during the whole of the disease, which was pretty severe. When the popular voice condemned the kine-pox, these two facts plead strongly, in the minds of *a few*, for an *arrest of judgment.**

* *From the Boston Chronicle.*

" Messrs. ADAMS and RHOADES,

" Having noticed some cases of the *supposed* kine-pox, published by Dr. Aspinwall, I think it may conduce to public utility to give you my own case, which was very similar to that given by the above inoculator.

" I was inoculated by Dr. Babbit, of Sturbridge, last December, with matter obtained from a practitioner in Connecticut. The matter had a purulent cast, and was part of a shirt sleeve worn during the plentiful discharge from the ulcerous state of the pustule. The inoculated arm appeared inflamed by the fourth day, and went on inflaming till about the eighth, when it became a running sore. At this time I had *shiverings, pain in my head, back and limbs*, with a *loss of appetite*, and at times was very dull and sleepy. The inoculated part became ulcerous, and discharged considerably, and at length terminated in an *irregular hard scab.*

" I had *eleven pustules* on different parts of my arms, body and face. From my symptoms I concluded I had passed through the true disease; but as neither Dr. Babbit nor myself had ever seen the disease, we were at a loss to determine respecting the appearance of the arm.

" While at Cambridge, attending the Medical Lectures, I consulted Dr. Waterhouse, who told me he very much doubted whether I had gone fairly through the *true* disease; and, to put it out of all doubt, would, if I wished, inoculate me. He did so, and I soon saw an appearance very different from what took place in my former inoculation. The inflammation was not so severe, nor did it resemble a boil so much as the former; nor did it terminate, like the former, in a hard, irregular *yellow scab*, but resembled, about the sixth day, the seed of the common *running mallows*, or what the children call *cheeses*, depressed in the middle. By the seventh day it preserved the same appearance, but grew larger: the eighth day it appeared full of watery fluid. On the tenth day the efflorescence came on, and gradually increased till it extended half round the arm. The whole appearance was now *strikingly different from my former case.* About this time, or rather pre-

At this gloomy period of the business I wrote to my correspondents in England for a fresh supply of vaccine virus, and gave out that the present season was not so favourable for the inoculation as the spring.

I gave Dr. Jenner a minute history of the whole business, and begged him to explain this *deterioration* of the virus: for I wish not to conceal my own perplexity at this period. That worthy man answered, that he had heard of our disasters, and would have given any thing could he have *hallowed* to me through a *speaking-trumpet*, across the Atlantic, only these words—"TAKE THE VIRUS BEFORE THE EFFLORESCENCE APPEARS." He soon sent me a fresh supply of matter, and a very lengthy and most lucid letter, which I cannot resist giving to the public in a pamphlet I am now preparing for the press, because it is a map of the road which the inoculator is to pursue, and which will for ever preserve him from losing his way.

The *Massachusetts Medical Society*, impressed with concern for the evil tendency of the many idle and false reports respecting the *spurious cases* at Marblehead, appointed a committee, consisting of their *President*, *Vice-President*, and myself, to inquire into facts on the spot, and make report. The communications made to that learned body from Marblehead were entirely to their satisfaction. Dr. Drury, of that town, wrote to me a very particular account of his inoculations

vious, my symptoms commenced: besides a slight swelling, and pain under my arm, I had the ordinary symptoms of fever, such as a pain in my head, and tenderness in my eyes, which was increased by the light. I had a tightness or stricture across my breast, an universal affection, *peculiar, and very different from what I ever before experienced.* It appeared to be a specific affection pervading the whole system, and which I felt in every fibre. My feelings were, perhaps, more acute from having rid on horse-back at night, and caught a severe cold. In my former inoculation, my system was oppressed with a train of irregular, and rather stupifying symptoms, with a dull head-ache. In this, my last inoculation, my symptoms arose gradually with the efflorescence, then as gradually subsided, and by the thirteenth day left me as well as ever.

"After my first inoculation I had thoughts of trying the experiment of the small-pox. Had I unluckily done it, I should have added another spurious case, to perplex, confound and discourage the inexperienced practitioner. During my inoculation, Dr. Waterhouse pointed out, from time to time, the difference in the appearances, as well as the symptoms, between the *genuine* and *spurious* cases, or those which will secure the human body ever after from the small-pox, and such as are no security at all.—At present I feel so confident that I have gone through the *genuine kine-pox*, that I have not the least dread of exposing myself to the natural small-pox.

"CYRUS FAY.

"*Nov.* 9, 1801."

from the matter taken from the arm of his son, and appeared to be thoroughly convinced that all his cases were *spurious*. He concludes his candid narrative in these words:

"On the whole, from what I have seen, it is my decided opinion that the inoculation for the kine-pox, if properly performed, *is a certain preventative of the small-pox*. The principal thing to be attended to in this operation, is to take the matter at a proper time, which, in my opinion, as I have now learnt, is commonly on the eighth or ninth day, and in a limpid state. The matter I used was in a *puriform* state, and mostly on thread."

In a letter from the Rev. Mr. Story, brother to Dr. S. dated 7th May, 1801, he says—"It ever has been, and now is my firm belief, that the kine-pox is a sovereign antidote against the small-pox. The only point to be determined is, whether the person has really passed through the *genuine* disease; for much spurious matter has been in use, which, though it may produce some eruptions, will be no security against the small-pox, as was the case of the bulk of those in this place. It appears that Dr. D. took matter for his inoculations on the thirteenth day.—I view the kine-pox inoculation as a most important discovery, and, when better understood, will be carried on with safety and advantage to the public."

To these respectable evidences I will just add, that I had inoculated my chaise-driver eight days before I went on this committee of inquiry from the *Medical Society*, and the clergymen, physicians, and other respectable characters in Marblehead, all declared that their unfortunate cases had a very different appearance. I did more: I found a person in one of the practitioner's families who had not passed through the small-pox, and inoculated him from my servant, that they might themselves see the true disease in all its stages. This crowned their conviction, so that now there is no town in New-England where they are more convinced of the efficacy of the kine-pox as a security against the small-pox, than *Marblehead*. *Lynn*, a town contiguous to Marblehead, has given ample proof of their full faith in this new inoculation, by submitting to receive the benefits of it from my hands.

I have been more particular in narrating the incidents at Marblehead, because they have been so often quoted, misconceived, and misrepresented, and because it may explain similar accidents in other places in America. The like occurrences took place at *Geneva*, and at several places in *England*, especially at *Petworth*, where the matter first sent by Dr.

Jenner to Lord Egremont did not succeed in communicating the disease; and a second supply, from another quarter, gave a *spurious* one: the effects produced formed a counterpart to the disasters at Marblehead. See the whole related by the Rev. Mr. Ferryman, and Mr. Andre, surgeon at Petworth, in a letter to Dr. Jenner and to Dr. Pearson, in *Ring's Treatise on Cow-Pox.*

With a fresh supply of matter from Dr. Jenner, through the hands of Mr. Ring, surgeon, New-street, Hanover-square, and also from Dr. Lettsom, Sir Grenville Temple, *Bart.* Dr. Pearson, the *Vaccine Institution*, Mr. Kerre, Mr. Wachsel, and Mr. Dunning, of *Plymouth*, I recommenced my inoculation in the middle of March, 1801, and have continued it, with undeviating success, to the present time, two short periods excepted. The first interruption in the continuity of my inoculations happened in the month of July, when the weather was *extremely* hot, and when I trusted to the infected thread instead of the fluid warm from the pustule. As I have given a particular account of the effects of the *hot weather* in destroying the efficacy of virus taken on *thread*, with the state of the *thermometer* and *hygrometer* at that time, in the *London Medical and Physical Journal* for October, 1801, I need not repeat it here.

The second interruption was from relying on some of my brethren (to whom I had given the matter) for the recent fluid, and thereby relaxing in attention to the continuity of it in my own patients. This was a source of inexpressible anxiety and perplexity. But for *one* patient the virus would have become extinct a *second* time in this part of the union. I mention this by way of caution to my brethren. Jenner himself informs me that he finds it needful to give and receive assistance, in order to keep up the necessary supply of fresh virus for use. But for the *Vaccine Institution* in London, they would hardly carry on the inoculation without some little interruption. The greatest difficulty in the vaccine inoculation is the scarcity of the virus. The kine-pock has but ONE pustule, while the small-pox has its *thousands and ten thousands.* The numbers of poor children I have inoculated during the hottest weather, in order to keep up a diurnal supply of matter; the anxiety I have endured lest they should fail; and the offence I have given when it was not in my power to transmit an inch of infected thread, are not mentioned in the tone of complaint, but merely to notify the young practitioner, who may be ambitious to distinguish himself in this department of his profession, that

he must not expect to diffuse the blessings of this benign remedy, and reap the rewards of it, without some trouble and some anxiety. Some must labour in breaking the road, and leave to those who come after the easier task of smoothing it.

BENJAMIN WATERHOUSE.

Cambridge, Feb. 1, 1802.

P. S. Although I have hitherto been so fortunate as never to have had a patient whom I had inoculated take the small-pox, I can by no means suppose that all I have inoculated are secure from it. Some never returned to me after the operation; and a few I remain doubtful of, but have not yet had an opportunity to re-inoculate them. They amount, perhaps, to a dozen.

ARTICLE II.

OBSERVATIONS *on the* INOCULATION *of the* KINE-POCK: *Communicated by* JOHN SPENCE, *M. D. of Dumfries, Virginia, to Dr.* WATERHOUSE.

FOR your reply to a letter I took the liberty of addressing to you last summer, on the subject of the Kine-Pox, I beg you will accept my most sincere acknowledgment.

By the polite attention of Mr. Mason, President of the Columbia Bank, I obtained some of the original thread you sent on to President Jefferson, in June, accompanied with a copy of your excellent letter. Immediately on the receipt of this thread, I wrote Mr. Mason, who I knew was extremely anxious to have his family inoculated, not to be surprised if he did not succeed; mentioning at the same time the singular delicacy of the vaccine fluid, how apt it was to undergo a decomposition and become inert, when exposed to much heat, and, in illustration of this, quoting the circumstances attending Dr. Woodville's journey to Paris, as stated in the Medical and Physical Journal, volume iv. This prediction of the possibility of a failure. with thread even recently infected, had, I believe, a good effect. I not only attempted to give the infection by the incision, as recommended by you, but introduced the thread by means of a small *blister*, as advised by Dr. Whyte, who inoculated Lord Elgin's son.—In every way, however, I had the mortification of seeing it fail.

About the beginning of last month, Dr. Gantt obligingly furnished me with part of some infected thread he had just received from the President, on his return from Monticello, where you know he had been practising the new inoculation with great success. Having found this thread efficient in the first instance, I have since continued to inoculate with limpid fluid, taken warm from the arm of a patient present; and, in doing so, have paid a religious regard to Dr. Jenner's direction, never to take the fluid *after the efflorescence comes on.* I have so planned the mode of conducting the vaccine inoculation here, as to have it almost invariably in my power to choose a patient, on *the eighth day of the disease*, with a vesicle containing lymph enough to inoculate from; and by this circumspection, and with the advantages of having patients in succession, I think I could continue the disease in its genuine form for any number of years. I have already inoculated about an hundred, and in this number there have not been more than five whom it was necessary to re-inoculate. This success in communicating the infection has been, so far, as great as I experienced in 1791, when I inoculated for the small-pox, in this town and its neighbourhood, upwards of 600.

Notwithstanding the liberal reception the new inoculation has met with, by the intelligent part of our society, there are a few persons (and to the honour of the inhabitants of this part of Virginia but very few) so prejudiced against every improvement in science, as to treat this mild preventive of the small-pox as a chimera, saying they can have no confidence in it till some cow-pock patients are subjected to the grand test, the inoculation of the small-pox. Not daring to introduce this test here, I some time since entreated Dr. Gantt to be as speedy in making his experiments as possible; but by a late letter I find he is obliged to send to Philadelphia for fresh variolous matter. This will cause an unfortunate delay. In consequence of this a great many have solicited me to address a few lines to you, and to state, as faithfully as I could, the history of the vaccine inoculation under my care. Knowing, Sir, the laudable zeal and benevolence you have displayed in diffusing the blessings of this invaluable discovery, which will render your name dear to every inhabitant of this populous State, I trust I need not apologize for this intrusion, being confident you will take the application of these anxious parents in good part. And such is the confidence they place in your experience and judgment, that your opinion on this subject will be received as equal to the test of the small-pox itself.

I should now submit to your consideration statements of cases extracted from my journal; but as these would be too lengthy, I beg leave to give the result of my observations on the process of the vaccine inoculation, which I have attended to with all the vigilance in my power.

Generally on the fourth, fifth or sixth day, I observe the inoculated part appears a little red and elevated. This increases in the form of a vesicle of a whey-like colour, depressed in the middle, and containing a moderate quantity of lymph, *always perfectly transparent*. On the seventh a beautiful damask-rose coloured areola appears, and increases till the crust or scab is formed. On the ninth, tenth, or eleventh day, the *specific* or constitutional fever comes on, accompanied with, or rather preceded by soreness under the arm, or a swelled gland in the axilla: sometimes this fever is scarcely perceptible. The brown crust begins commonly on the twelfth or thirteenth day, is *indented* in the centre, is glossy, and surrounded with a whitish vesicular ring. Around the crust there is a core, tumid, inflamed, with irritated eminences. When this hardness and inflammation subside, the cuticle assumes rather a livid hue, cracks, and peels off in minute white scales. On the eighteenth or nineteenth day the crust becomes dry and contracted, loses its gloss or polish, and is of a dark brown colour, approaching to black. On the negro this crust is jet black.

From this general process I have met with considerable deviations. In one child there was no perceptible elevation or redness till the eighth day, after which it pursued the usual stages with great regularity.

Hitherto only three of my patients have had the fever so high as to be obliged to go to bed for a few hours. I think the vaccine fever may be strictly termed *ephemeral*. Those who had their fever so high were children attending school, who ran about, and took very active exercise.

The erythematous or efflorescent circle so conspicuous generally on the tenth day, has described various circumferences. Sometimes the efflorescence has extended from the shoulder to the elbow, formidable in its appearance, but without danger, and never attended with much pain, at least the pain is by no means in proportion to the appearance of the inflammation. This efflorescence always disappears in the course of two or three days.

Some have had pretty sore arms, but this has generally been owing to the tightness of the clothes, scratching the pustule, or allowing the linen to stick to the sore. In some unruly

boys I have seen the scab rubbed off four or five times. Cooling applications, particularly weak solutions of sugar of lead, operate in such instances like a charm.

In none of my patients (and I have made very minute inquiries) have I seen any *eruptions*, nor, excepting two cases, any *fugitive pustules* round the inoculated part.

Soon after I commenced the new inoculation here, two spurious cases occurred. A young gentleman of intelligence and discernment, but not bred to physic, who had read with great attention your letter to Mr. Jefferson, and the few books I had on the kine-pox, inoculated three children of a poor family, from the arm of a mulatto girl *late on the ninth day of the disease.* One of these children, a boy about ten years of age, had the *true* disease, and on the eleventh day a small pustule appeared near the inoculated part. The other two children, his sisters, who were inoculated from the *same subject*, and at the *same instant*, had the disease evidently in a spurious form. The vesicular elevation appeared sooner than what I had observed in any of my patients: it was *convex;* and on the ninth day there was on both their arms a rough, prominent, yellow crust, surrounded with a small inflamed margin—no fever—no uneasiness in the axilla.

These children have since been inoculated and done well.—A case bearing some resemblance to this singular one is mentioned by Lord Derby, in a letter to Dr. Denman. See Med. and Phys. Journal, vol. iv. page 2.

On this occasion I felt, I assure you, not a little anxiety, partly from my inexperience in the new inoculation, and partly from an apprehension of losing what I believed to be the genuine vaccine virus; but I soon had reason to regard the occurrence as fortunate. It inculcated on my mind the caution in the first part of this letter, to select from my patients, whom I wished to inoculate from, *those only who, on the eighth day of the disease, had a well defined vesicle, containing a pellucid fluid.*

These occurrences had also the happy effect of teaching those gentlemen who had entire confidence in the benignity and sheltering powers of the vaccine disease, and who supposed it might be carried on with great facility by any body, this useful lesson—" that this gentle, unoffending, and benevolent stranger, was to be treated with the greatest delicacy and circumspection, and entrusted exclusively to the care of those who had studied with attention its real character; and that it would assuredly withdraw itself in that moment in which it was neglected."

These cases gave rise likewise to a circumstance too important to be omitted. The circuit or district court of Virginia, a court of the greatest dignity in this State, except the high court of appeals, meets at this place twice a year, in the months of May and October. Last month, when the new inoculation was making some noise here, the Hon. Judge Prentis, whose place of residence is at Williamsburg, and who had all his children inoculated last spring with the spurious matter introduced into this State, and which did not resist the small-pox, spoke of the Jennerian discovery with a good deal of indignation. Hearing this, I took the earliest opportunity of letting him know how the President had obtained the vaccine matter from you, and that its effects were widely different from any thing he had hitherto seen. Candid and open to conviction, he visited with me a number of patients of all colours, in the various stages of the disease; and, on seeing their arms, at once declared the appearances were completely different from the inoculation on James-River. I then showed him what I believed to be two spurious cases, at which he was forcibly struck, observing that his children's arms had precisely *such a crust and such an inflammation*. He told me, at the same time, that the matter with which his children were inoculated was *yellow*, and the scab of the same colour; and that he never discovered them to have any fever, soreness under the arm, or swelling in the axilla. These cases made such an impression upon him, that he desired me to furnish him with some fresh infected thread, with the necessary instructions for carrying on the new inoculation with certainty. For these instructions I was indebted to your letter to the President. But in order to illustrate the subject more fully to those gentlemen who had been formerly inoculating in that part of Virginia, I quoted these few, but impressive lines, in a letter I had the honour of receiving from you last summer: "Please to present my compliments to Dr. H——, and tell him, that if he inoculated with *yellow* matter, or by his inoculation produced *yellow* matter, I hesitate not to say, that it was not the true disease. Nay, further, if the virus did not lay dormant until the fifth, sixth, or seventh day, it was spurious. If it occasioned inflammation and a *purulent* collection of matter by the third day, I want no further evidence of its being the *spurious*, and not the *true* disease."

Knowing the horrors which the name of the small-pox excites in the minds of the inhabitants of this State, and the impossibility of introducing that disease here, so as to try its

effects on my vaccine patients, I thought it my duty to make such experiments as would prove satisfactory to myself, and ascertain whether or not the matter I had been inoculating with was really genuine. Being convinced by a report of the Vaccine Institution of London, that those persons who had undergone the *specific cow-pock pustule and fever*, were ever after unsusceptible not only of the small-pox, but of the cow-pox a second time, and that those who had undergone the small-pox were also unsusceptible of the cow-pox, I made the two following experiments in the most public manner.

On the 30th of October I inserted, by two incisions, into the right arm of a healthy boy, who had fairly gone through the cow-pox, some limpid fluid immediately from the arm of a patient on the eighth day of the disease. On the 2d and 3d of November, both the incised places were evidently infected. There was a tumour and redness. On the 6th of November the inflammation and swelling had nearly gone off, without producing a vesicle, or any constitutional effect whatever.

On Thursday, the 5th of November, I inoculated myself, by two incisions, with fresh vaccine virus from the arm of a young patient on the eighth day. And here it may be proper to observe, that this patient was one of the *three* who were obliged to go to bed on account of the fever, which came on about forty-eight hours after I had taken the fluid from her arm.

Fifth day, Monday, 9th. Yesterday and to-day the inoculated parts have itched a little. They are now red and elevated. Some medical friends, to whom I showed my arm, pronounce it positively infected.

Eighth day, Thursday, 12th. The inflammation and swelling almost gone.

Eleventh day, Sunday, 15th. The incisions are now dying away like common scratches. No pustule has arisen, nor any constitutional affection whatever.

In the foregoing experiment on myself, I confess I have been disappointed. Being of a habit of body rather corpulent, taking a good deal of exercise, and living freely, I expected, and, indeed, predicted to my acquaintance (on the authority of Mr. Aikin), from the swelling and inflammation which appeared on the fifth day, that I should probably have a vesicle on my arm sufficient to inoculate from. So far, then, as these two experiments go, and I can vouch for the fidelity with which they have been conducted, they contradict the statements of that gentleman.

Of the genuineness of the vaccine matter I now possess, I entertain no doubt; and I might conclude with a small alteration of the words of the celebrated Gaubius on another occasion—"Fallor, ni sua constiterit *Jennero* auctoritas et fides, *naturæ* virtus et ordo."

With sentiments of the highest respect, gratitude and veneration, I am, Sir,

Your most obedient servant,

JOHN SPENCE.

Dumfries (Virg.) Nov. 15, 1801.

P. S. Having seen the direful effects of the small-pox in my native country, among my own relations, and in Virginia soon after my arrival, I think I can appreciate, as well as most young medical men, the intrinsic value of the discovery of the immortal Jenner.

Although I have repeatedly applied to different booksellers for the publications of Drs. Jenner, Woodville and Pearson, on the cow-pox, I have not, as yet, been fortunate enough to obtain any of them. All the information I have from books on this disease has been derived from your first pamphlet, a perusal of Aikin's little work, the scattered observations in the Medical and Physical Journal; but, above all, from your valuable practical letter to President JEFFERSON, so often mentioned in this communication.

ARTICLE III.

ANSWER *of Dr.* WATERHOUSE *to the preceding* LETTER.

DEAR SIR, *Cambridge, Nov.* 30, 1801.

I HASTEN to transmit for your acceptance what transcends all verbal descriptions, the painted representations of the vaccine disease through all its stages, and these, too, contrasted with the small-pox.

They were sent me by my *Magnus Apollo*, JENNER. I sent one to the President, another to Dr. Mitchill, a third to yourself, and keep three myself. I am sorry I am obliged to crease it, as I presume you would choose to glaze it.—Judge of the identity of your disease by these admirable representations of it.

At present I answer generally, that I have no doubt of the

genuineness of your cases, and as little doubt of those inoculated by "the young gentleman not bred to physic," being *spurious.*

Aikin did not write from his own experience, nor even from that of his learned father. I wonder so little at his mistakes, that I admire they are so few. Several there certainly are, besides the one you have detected. Spurious cases will arise if you follow his rules respecting *the time* of taking the matter. There are several streams from the Jennerian fountain, some more limpid than others, but none so clear as the source. Even his private letters to me are as lucid as a sunbeam: "*Ex digito Herculem*" may be said of all of them!

Believe me to be, with sentiments of esteem,
Dear Sir,
Your very humble servant,
BENJAMIN WATERHOUSE.

Dr. SPENCE.

ARTICLE IV.

EXTRACT *of a* LETTER *from Dr.* SPENCE *to Dr.* WATERHOUSE, *dated Dumfries, March* 6, 1802.

I HAVE, from time to time, re-inoculated many of those patients who had undergone the kine-pock, some even a third time, but the effect produced by the virus has always been merely local.

Since I wrote to you I have also inoculated six persons who had evident pits of the small-pox on their bodies, and always by two or three incisions, and with fluid lymph applied immediately from the pustule of a patient present; but although, in all these instances, the incised places were infected, there did not appear on any of them "a *distinct* vaccine vesicle, nor the specific fever and efflorescence, followed by the brown, concave, glossy looking eschar or scab." One gentleman, indeed, who resides near this town, and who chose to submit to the experiment, informed me, that on the fifth day after inoculation he squeezed from the inoculated part two or three drops of limpid fluid, but on the fourteenth day no mark of the incisions was to be seen. I lately inoculated a boy of thirteen years of age, whom I inoculated for the small-pox in 1791. On the fourth day the incisions itched so much that he absolutely tore the parts. They festered; and on the se-

venth day there was a small tumour, with a yellow crust, containing some pus: there was also a little inflammation around the tumour, and a swelled gland in the arm-pit. This was evidently not the kine-pock, but such an ulceration as will occur in an irritable habit, whenever common scratches are treated with the same violence. Three of his brothers, who had not had the small-pox, were inoculated at the same time, and from the same patient. They had the disease very distinctly and favourably, and none of them complained of the itching sensation.—Some weeks since I accidentally punctured the little finger of my left hand with a lancet stained with recent vaccine fluid; but, although I felt the lancet, no blood flowed from the puncture; and, having immediately washed my hands, I thought no more of it. Four days after, however, there was an unusual itching and smarting in my finger, which made me involuntarily rub it very roughly. It still smarted; and, on examining the place, I observed a little conical tumour, raw on the top, and discharging some lymph. For two days it felt very uneasy—was surrounded with an inflamed margin—and I now perceived a swelled gland, painful to the touch, a little above the elbow. Having recollected how the tumour was produced, I attended very minutely to the subsequent circumstances, but no efflorescence took place; no gland swelled in the axilla, although this is not material; no fever ensued; yet the sore did not heal up till about a fortnight after I had bruised the place; but there is a small superficial cicatrix on my finger, which will be visible, I suppose, during life. On my arm, on the contrary, which I cautiously avoided scratching, and which was not injured by a tight sleeve, there was no pustule, nor any ulceration, and every vestige of the inoculation there has vanished.

It is worthy of remark, that in the foregoing experiments with the vaccine virus on those who had passed through the small-pox, this sensation of itching, smarting or burning, has occurred to a much greater degree than with any of my cow-pock patients. I intend to prosecute these experiments; and should the result, in any instance, be different from the cases above stated, I shall immediately let you know.

ARTICLE V.

A Reply *to Mr.* Cruikshank's Observations *in* Defence *of the* New System *of* Chemistry, *in the fifth Volume of Mr.* Nicholson's *Journal, page* 1, *&c. In a Letter from Dr.* Priestley *to Dr.* Woodhouse, *Professor of Chemistry in the University of Pennsylvania.*

Dear Sir,

THOUGH you are an advocate, at least in part, for the new theory of chemistry, the principles of which I controvert, your candour is such, that I wish to address to you what I have to reply to the observations of Mr. Cruikshank on the subject of the experiment with *finery cinder and charcoal*, which you repeated in a manner that does you the greatest credit.

These two substances, though heated separately till no air or vapour of any kind can be expelled from them, yet when, immediately after this, they are heated together, they yield a large quantity of air, a great proportion of which is inflammable, and the new theory, which excludes phlogiston, requires that this inflammable air be a component part of water, which, of course, must be found in one or other of the two substances. Mr. Berthollet thinks it was contained in the charcoal, notwithstanding the heat to which it had been exposed. You allow, with me, that it was in the finery cinder, though we differ with respect to the decomposition of it. But Mr. Cruikshank has suggested a very different hypothesis; maintaining that water is not at all necessary to the production of this inflammable air; asserting that metals and their calces, in a very high temperature, have the power of decomposing fixed air, and that, in this case, the fixed air comes from the oxygen in the finery cinder, and the carbone in the charcoal.

After repeating my original experiment, which he found to be just, he did the same with the calces of other metals, particularly those of zinc, copper, lead, and manganese, and then concludes (p. 4), that "in all these cases the air must come from the partial decomposition of the carbonic acid by the calx, when raised to a high temperature." But the inference that I think is more naturally drawn from them, is, that all these calces contain much water, and little or nothing else. This I have shewn to be the case with respect to several of them, especially that of zinc, and I doubt not but

that some small portion of oxygen may be contained in them all. Indeed, we cannot absolutely say that any substance can be wholly expelled from any other with which it has been intimately combined by any process.

Before Mr. Cruikshank admitted that iron, or its calx, when raised to a high temperature, can decompose carbonic acid (fixed air) in this experiment, he should have tried whether it would do it in any other. If in any case, I should think it would do it when it was heated in this air by a burning lens, by which a greater heat can be produced than in any open fire. But this I found not to be the case, either with iron or this calx of it. In the last summer I went through a course of experiments with this view; but I always found fixed air not to be decomposed by this means; though I found that a portion of this air, and also of all the other kinds of air that are readily imbibed by water, was rendered immiscible in water by means of *heat*, reflected either from the calx of any metal, a piece of earthen crucible, or any other substance on which I threw the focus of the lens, when it was surrounded by this kind of air, confined by mercury or water. This, however, was no decomposition of the air, as there was no oxygen found in it after the process. The addition of permanent air was always *phlogisticated*.

Mr. Cruikshank thought that if this heavy inflammable air came from the decomposition of the carbonic acid by the calx, he should succeed better by employing *iron filings* in the place of finery cinder, "as they would have a greater affinity with oxygen;" and with this view he heated them together with a quantity of "common *chalk*, previously exposed to a low heat for ten minutes." From this mixture he procured a great quantity of air, and he thought that the acid (i. e. fixed air from the chalk) was decomposed by the iron; whereas, when he used well burned lime he got little or no air.

What I infer from this experiment is, that the chalk not being perfectly calcined, contained some water as well as fixed air; and that this water, uniting with the phlogiston of the iron, formed the inflammable air that he found. Water I suppose to be the basis of all kinds of air, and many substances retain it in any degree of heat. Chalk I have found to do it after long exposure to the heat of a smith's forge.

Admitting the fixed air procured in the experiment with the finery cinder and charcoal to come in part from the oxygen in the finery cinder, how is this oxygen to be expelled from the calx, since heat will not do it? And there is no instance, I believe, in chemistry, in which, when heat alone will not

expel any constituent part of a substance, it can be effected without the aid of an *affinity*, in consequence of which some other substance takes its place. But here, according to the new theory, nothing is supposed to take the place of the oxygen in the finery cinder, since it takes nothing from the charcoal, the iron being revived by the mere expulsion of the oxygen which made it a calx.

Mr. Cruikshank lays great stress on the difference that he found in the air that he procured in these processes, from that which is got from charcoal and water. But I have observed that there is a considerable difference in the qualities of heavy inflammable air, not only according to the substance from which it is procured, but in the successive stages of the same process. He will find that I have examined this kind of air, as procured from a great variety of substances made to pass in the form of vapour through hot earthen tubes, and in various other ways, and have given the analysis of them. I always found that the first portion from charcoal was loaded with fixed air, but that, in the course of the process, this disappeared, the air burning with a lambent flame, and that towards the end it approached to the explosive kind, such as is obtained from the metals by acids.

I also found that more or less fixed air is procured by the decomposition of heavy inflammable air by means of dephlogisticated air; and though the air procured from finery cinder and charcoal shewed no sign of its containing any mixture of fixed air (nothing of the kind being discoverable by lime-water), yet when it was decomposed I found much more than the weight of the air, so that it could not have been previously contained in it in a state of solution, but must have been formed by the union of the oxygen in the dephlogisticated air, and the phlogiston in the inflammable air.

That charcoal, uniting with water, should give fixed air as well as inflammable air, I account for by supposing, what is by no means improbable, that this substance contains the elements of both the kinds of air, and that they want nothing but water to enable them to take the form of air.

On the whole, I think it is evident that Mr. Cruikshank finds fixed air in circumstances in which it cannot be formed, and makes it to be decomposed by substances which have no such power.

Submitting these observations to your better judgment,

I am, dear Sir, yours sincerely,

J. PRIESTLEY.

Northumberland, Nov. 21, 1801.

ARTICLE VI.

To the Editors of the Medical Repository.

GENTLEMEN,

I LATELY sent you, in a letter to Dr. Woodhouse, a reply to the observations of Mr. Cruikshank, in answer to one of my arguments in favour of the doctrine of phlogiston, which he says you will be so obliging as to insert in your next number. I have, since that, received a letter from a correspondent in Paris, in which he informs me that the chemists in that city boast greatly of those observations of Mr. Cruikshank, and say that I must now give up the controversy: I therefore beg, that to that letter to Dr. Woodhouse you would please to add this.

I am not a little surprized that such excellent chemists as the supporters of the new theory in France unquestionably are, should make so great account of the aid of a person who has abandoned the most essential part of their system, viz. the necessity of water to the formation of inflammable air. Mr. Lavoisier, treating of the inflammable air from charcoal and water, which is similar to that from charcoal and finery cinder, says, in his "Elements of Chemistry," p. 87 of the English translation, that "it cannot be disengaged from the charcoal, and must consequently be produced from the water." According to the new theory, the union of the oxygen, which is supposed to come from the finery cinder, with carbone, from the charcoal, can only form fixed air, and no kind of air that is inflammable. Mr. Cruikshank must therefore abandon the new theory in order to support his peculiar hypothesis.

If I do not receive a better defence of the new theory from its able supporters in France, I shall soon conclude that it is incapable of any just defence, and that, as becomes ingenuous men, they will abandon it, as Mr. Cruikshank has actually done.

I am, Gentlemen,
Yours, &c.

J. PRIESTLEY.

ARTICLE VII.

An Account *of a* Case *of* Pulmonary Consumption *successfully treated by a* Salivation. *In a Letter from* George Pfeiffer, *M. D. to Dr.* Benjamin Rush.

Dear Sir, *Philadelphia, Jan.* 29, 1802.

Although, in medicine, as in other sciences, the limited faculties, and, consequently, the limited knowledge of man, precludes the probability of his ever being able to form a perfect system, still does it afford matter of pleasure and encouragement to reflect, that by his experience, and the exercise of his reason, aided by those fortunate accidents which have always had so great a share in the prosperous issue of his affairs, he has been progressively conducted to the attainment of grand and important truths—truths by which many of the evils incident to his condition here have been ameliorated or destroyed, and new sources of happiness opened to him.

One of the most pleasing subjects of contemplation afforded by the present period, so rich in moral and physical improvements, is the prospect of bringing into subjection to our art, a disease which has hitherto baffled the collected experience and skill of the whole medical world, and annually given to the grave its thousands and tens of thousand of victims.

This prospect was presented to my mind by the perusal of three letters, written by you to Dr. Miller, of New-York, on the salutary effects of a salivation, and also of tonic remedies in pulmonary consumption.*

Do not think I mean to flatter you, Sir, when I declare that I never read any thing in my life which excited a feeling more nearly approaching to ecstacy, than did that little production.

Instantly I determined to avail myself of so promising a practice in the very first consumptive case that should offer itself to my attention.

Besides several doubtful and complicated cases, I have lately met with one which, to me, appears unequivocally to have been a true phthisis pulmonalis.

In the hope that it will give you some satisfaction, I take the liberty of transcribing the history of it for your perusal.

* See Med. Rep. vol. v. p. 5.

—— Will, aged fifty-five years, a tall, slender man, by trade a house-carpenter, when labouring under a catarrh, in the summer of the year 1794, was suddenly seized, during a violent fit of coughing, with an alarming hæmoptoe, by which he lost a considerable quantity of blood, and his strength was much reduced. It was soon checked, however; and though there were several slight returns of it, he, in a few weeks, recovered his usual share of health, and followed his trade without inconvenience, till the autumn of 1798, when he suffered an attack of the yellow fever. Since that period he thinks he never has felt so strong as he did before; and through the course of the last summer his strength declined so rapidly, that by the beginning of September he was scarcely able to continue his work; and towards the end of the same month he was seized, as he thought, with the bilious fever, which was then the reigning epidemic in Philadelphia, and very prevalent in the Northern Liberties, where he resides. But the symptoms of his disorder, from the very beginning of his confinement, so far as I have been able to collect them, both from his own mouth and his wife, instead of bearing the character of our autumnal remittent, were rather characteristic of hectic fever and advanced pulmonary consumption. They were frequent and irregular alternations of chills, fever and sweats, with pain in the thorax, and a distressing heavy cough, which was most severe at night, attended with a copious expectoration of pus-like matter. There was also a steady, and often an excruciating pain, in his left hypogastric region, but no perceptible enlargement. Under these symptoms I found him labouring early in December, when I first saw him, and so weak as to be unable to rise from his bed without assistance.

A few minutes at his bed-side were sufficient to impress my mind with the most thorough conviction that he was far advanced in phthisis, and that, without speedy relief, he would probably not live more than a few weeks, and certainly not till spring. He had taken some medicines, amongst others nitrous powders; but without any relief.

I immediately prescribed your nitrous antimonial powder, with a little opium, and from half a grain to a grain of calomel in each, and directed him to take three powders daily. At night he took an antimonial anodyne draught; and on the painful side I ordered a quantity of warm spirits, or camphorated spirits, to be rubbed several times a day. This course was pursued for about ten days, when, observing no effect to be produced on his mouth by the powders, I ordered, in ad-

dition to them, strong mercurial ointment to be applied to his side twice a day, instead of the camphorated spirits.

After an ounce of the ointment had been used, a gentle salivation began, which continued about three weeks, with scarcely any inconvenience to the man, who took no other medicine, after the salivary disease was induced, but a paregoric draught occasionally.

As the spitting progressed, all the symptoms of his disorder gradually subsided; and, by the time it ceased, his irregular chills, fever and sweats, as well as the purulent expectoration, and the pain in his side, had entirely left him. Only a slight cough remained, which was soon vanquished by the paregoric draughts above-mentioned. His appetite and strength returned, as if by a charm; and, on going to his house a few days afterwards, I was both astonished and delighted to find him hard at work with his saw. He declared he felt perfectly well, and was not at all fatigued by his labour. I advised him to take two or three glasses of Madeira wine every day, for some time, to keep his bowels open, and wear a flannel shirt next to his skin. I saw him, for the last time, on the 23d instant, when he still continued in perfect health.

Thus, Sir, have I given you a faithful account of what, to me, appeared a desperate case of disease, and which I had very faint hopes of being able to conquer, even with the aid of the Hercules of Medicine, although I had your powerful testimony in its favour, and my own knowledge of its general and unexampled efficacy.

As the issue has turned out, I contemplate myself as having been, through you, the humble instrument of rescuing a fellow creature from certain death.

Believe me, dear Sir, I consider myself greatly your debtor, and am, with true respect,

Your obliged friend and humble servant,

GEORGE PFEIFFER.

ARTICLE VIII.

To the Editors of the Medical Repository.

GENTLEMEN,

THE first number of the fifth volume of the Medical Repository, containing a reply to my remarks on the subterranean wall, by Dr. James Woodhouse, Professor of Chemistry in the University of Pennsylvania, came to hand at the time I was preparing for a journey into the northern parts of Vermont. On reading the reply, I determined to give it an answer the first leisure hour. My journey, however, consumed nearly two months; and, on my return, I found, for several weeks, no leisure for the proposed answer. After so long and indispensible a delay, and after I had more attentively read the reply, I formed the determination to continue silent on the subject. This determination was adopted, not because I considered my opinion, that the wall is a production of art, refuted, nor because I had renounced that opinion; but because I viewed my former observations as a sufficient refutation of the reply, and was perfectly willing to submit the question, without any additional remarks, to the decision of the scientific readers of the Repository.

But, since my silence has been construed into a renunciation of my opinion; since Dr. Woodhouse has very politely and *modestly* reported, that, after reading his reply, I was fully convinced of my error, had published a retraction of my sentiments, and extremely regretted that I had ever written any thing on the subject;* I feel myself compelled to come forward, and remind the Doctor, that the information with which he has obliged his friends is wholly incorrect; that his reply, although managed with *great ingenuity*, has not produced conviction; nor induced me to retract, either publicly or privately, my former opinion; nor excited the least regret that the account of the wall was published.

I will now briefly review the arguments contained in the reply.

1st. The author both commences and concludes his attack with what he probably considers a refutation of the idea that

* That Dr. Woodhouse has thus reported, I have received information through a channel too direct and respectable to admit, for a moment, a doubt of its correctness.

the wall was constructed by some enlightened antediluvian nation. Is he alarmed with the apprehension that the wall, should it be admitted to be artificial, may throw some light on the subject of the general deluge, or the manners and customs of the antediluvian world? If it will afford any alleviation to the anxiety of the good Doctor, I have no hesitation to declare, that, until a farther investigation of the wall be made, I have no intention to deduce from it any proof or inference in favour of the Mosaic account of those subjects.

In my account of the wall I intimated that it was not necessary, in discussing the main question, to show the precise object for which the wall was made. A probable object was then mentioned, after which several others were stated as being possible, which the replier has been pleased to pronounce, with a degree of sarcasm, merely imaginary. These objects, it will be remembered, were stated, not as probable, but possible; and they will still be considered possible, until Dr. Woodhouse shall have proved to the contrary. He has prudently omitted to include, in his general censure, the only object stated as probable, and has passed it by wholly unnoticed. From my observations on the subject, every intelligent eye would have at once discovered it to be my prevailing belief that the wall has stood many centuries, and was originally constructed for a wall of defence. And, let me ask, is it the part of a logician, or a philosopher, in sober debate, to aim his whole force at ideas which are professedly imaginary, or, rather, which are stated as merely possible; and to pass over those which are stated as probable, and on which the writer has grounded his argument?

2dly. "Muscle-shells," says Dr. Woodhouse, "exposed to the action of fire, are almost entirely converted into quick-lime; but in one hundred parts of the cement there is no more than five parts of this earth."

It is then true, as appears from his own analysis, that one ingredient in the composition is quick-lime.

But there is still an objection. "Muscle-shells contain no iron, and there is a considerable portion of this metal in the cement."

Does not experience teach us, that, by a partial decomposition of iron, the contiguous earth will, in the course of a few years, be in some degree impregnated with the properties of the metal? Does not the composition of lime and clay, contiguous to an iron bolt, in a brick or stone wall, imbibe some portion of the iron? And is it unphilosophical to sup-

pose that the cement has been thus impregnated with the iron property, or even with all the properties of the stones which compose the wall?

3dly. "What is called fullers' earth," it is said, "never turns of a white colour like the cement; and the clays of this country, with a few exceptions, burn of a red colour."

Under this head Dr. Woodhouse proceeds on the ground, that I had given the opinion that the cement is composed of fullers' earth. No such opinion was advanced. The ground is false; and, of course, the argument built upon it must be incorrect. In my remarks on the wall, I observed that, at a small distance, there is found a species of clay, resembling (externally) fullers' earth, without any intention of marking its specific character.

It appears that there are a "few exceptions" to the Doctor's general rule. May not the clay, mentioned as probably a component part of the cement, be a species included among the exceptions?—Notwithstanding the arguments and experiments of the mineralogist, sufficient, it is believed, has been advanced, under this and the former head, to justify the supposition that the cement is clay, or a mixture of lime and clay, impregnated with the properties of the stones.

"In order to prove," continues the replier, "that the cement is composed of fullers' earth, or of this kind of earth mixed with burnt muscle-shells, it will be necessary to show that a mechanical mixture of these substances gives the same principles by analysis as the cement."

I have in possession none of the clay nor shells with which to execute the proposed analysis. I might, perhaps, be more solicitous to obtain the ingredients, were it not, as I shall hereafter attempt to prove, totally unnecessary, in supporting the principal question. For the present, I will leave it to Dr. Woodhouse to "show, that a mechanical mixture of those substances," *when equally impregnated with iron*, "will give, by analysis," *different* "principles" from those of the cement.

4thly. A passage is quoted from Garnet's Tour through Scotland, to show that the regularity of the wall is no proof of its being a production of art.

The quotation I have read; and, with pleasure, acknowledge my obligation to Dr. Woodhouse for conducting me to an authority so corroborative of my own remarks. In the passage, in the volume from which it was taken, and in the accounts of Fingal's Cave, the Giant's Causeway, and the ba-

saltes of various countries, given by the most distinguished mineralogists of Europe, I have discovered nothing contradictory to my former observations on this subject. Although regularity is strikingly visible in some of the pillars of Fingal's Cave, yet most of the vast pile is extremely irregular; and the whole mass, taken collectively, furnishes an exhibition of rudeness, of sublimity and grandeur, beyond any thing ever formed by the human hand. The object is so stupendous, that no enlightened eye ever, for a moment, viewed it as the work of art. It has not the appearance of having been formed of individual stones, by the industry of man. It is not, throughout, constructed with uniform mechanical exactness. With all its regularity, it bears evident marks of the rude hand of Nature.

5thly. An extract from the British Encyclopædia, which had been brought forward to prove that the strata of basaltes never run horizontally, is asserted to be "not true." In support of his assertion, he has mentioned the authority of Mr. Strange, and of M. l'Abbé Giraud Soulavie. I regret that I have not been able to procure the volumes to which he has here referred. I have, however, read a number of the most eminent authors on the subject of basaltes, and have not found a suggestion in support of the horizontal position of the strata, *while in its native state.*

Garnet, in his Tour through Scotland, a work which Dr. Woodhouse has more than once quoted, remarks,* "The basaltic pillars of Staffa are all magnetic; the lower parts possessing a north, and the upper parts a south polarity." Again:† "On the top of the island, above those ranges of columns, the green turf was often interrupted by lesser pillars, inclined in almost every direction, but generally dipping towards the west, forming an angle of 30 deg. with the horizon." In describing the small island of Booshala, the same author observes,‡ "This little island, which is in the form of an irregular pyramid, is entirely composed of basaltic pillars, inclined in *every direction*, but *generally* pointing towards the top of the cone: many of them are, however, horizontal, and some are bent into arches of circles."

In this passage the author does, indeed, mention a solitary instance of the horizontal position of the pillars; but this is evidently an *accidental*, and not a *natural* position. The

* Garnet's Tour through Scotland, vol. i. p. 230.
† Garnet, vol. i. 219.
‡ Garnet, p. 220.

learned naturalists who have examined these astonishing curiosities, concur in the opinion, that this island, or rather this basaltic pile, was originally a part of Staffa, and has been broken asunder by some great convulsion—possibly by the waves of the ocean. It is not at all singular, that, in the general confusion, the pillars should be thrown "in every direction;" and that many of them should fall into a horizontal position. From this broken and confused mass nothing can be inferred respecting the natural direction of the pillars or strata.

Similar may be the facts with the basaltes described by Mr. Strange, and by M. l'Abbè Giraud Soulavie.

Dr. Woodhouse ought to have pointed us to some collection or wall of basaltes, many hundred feet in length, of considerable height, of uniform thickness, and composed of fragments running horizontally, extending one third, or one half of the thickness of the wall, and forming a right angle with its length. Until he shall have shown a pile, bearing, at least, some general resemblance to this, the reader will, it is presumed, allow the extract to be correct, and will give full weight to the argument grounded thereon.

6thly. He also pronounces unjust, the observation that there is nothing between the basaltic columns of other countries resembling the cement of the wall. He says, on the authority of Garnet, that "a cement of a beautiful white colour is found between the basaltic pillars in the Cave of Fingal."

Like a prudent logician, the Doctor has omitted to give us the passage, lest he should prove too much, and his argument fall to the ground. The passage referred to I here take the liberty to transcribe:—"Between these pillars is often found a cement, generally of a beautiful white colour, interspersed with rhomboidal and prismatic crystals, which are sometimes tinged with green. This substance is, in general, calcareous spar (crystallized carbonate of lime). In some instances, however, the place is filled up with infiltrations of beautiful white zeolite. In the very midst of the basaltic pillars, when broken, are to be found pieces of radiated zeolite."*

That these substances are found in the cement of the wall, it will be remembered, the replier has not pretended.

It will also be remembered that Garnet, in the passage above quoted, asserts that a cement is often found between the *pillars*—not *between the strata* which form each individual

* Garnet's Tour, vol. i. p. 224.

pillar; whereas, in the wall, each fragment, or stratum, is entirely covered with cement. But, as this extract appears to be so unfortunate for Dr. Woodhouse, it would be, indeed, a violation of delicacy to accompany it with any farther comment.

. Had Garnet informed us that the pillars, like the wall, are composed of small distinct fragments; that each fragment is completely covered with cement; and that the external surface of each pillar is plastered with a similar substance, I would, at once, have relinquished this part of the argument. Unless I receive such information, I shall continue to indulge the opinion, that the wall, as it respects its cement, differs materially from the basaltes of other countries.

Dr. Woodhouse, in a letter* to the Rev. Mr. Hall, remarks: "The fine white friable matter, with which you suppose the wall has been plastered, is owing to chemical decomposition."

On this supposition, how is it possible, let me ask, that the whole face of the wall should be smoothly and firmly plastered with the decomposed substance? Would not each individual fragment, after the partial decomposition of the external surface, retain its original figure; and would not the face, or side of the wall, be filled with cavities or chinks?

Under another head, which shall be again noticed in its order, he informs us that "the stones are decomposed or calcined by the agency of water."

Were this the origin of the cement, is it not rational to suppose that the parts, constantly immersed in water, would be found in a greater degree decomposed, would contain a greater quantity of cement, than the parts which are perfectly dry? Should one part of the wall, or of each fragment, be decomposed with more expedition than the other, as, according to his theory, must unquestionably be the fact, would not the part first decomposed first settle, and thus lean or incline to the one side or the other, in various parts of the wall? Would the wall be uniformly erect, firm and strong?

7thly. Dr. Woodhouse informs us that "he has fused the stones of the wall with the greatest ease in half an hour."

As I acknowledged that the stones may be of the basaltic character, it is unnecessary to make any reply to this head. In justification of my remark that the stones are not fusible by a moderate fire, I will only observe, that I made the experiment in a very hot fire for more than half an hour, without producing any visible effect.

* Published in the Medical Repository, vol. ii. p. 259.

8thly. Dr. Woodhouse says, "The position that neither stones, nor other mineral substances, are covered with rust unless they have been exposed to the action of the aërial acid, is not accurate."

I suspect our author, should he go a little more deeply into the subject, would find his own remarks fully as inaccurate as the position he is attempting to refute. The word rust, he informs us, "is a vague term, and conveys no precise idea to the mind." It is, however, believed, that the simple term *rust*,* as vague as it may be to the mind of our chemist, conveys to the minds of others as "precise an idea" as the phrase "ochreous matter."

"The brown ochreous matter," he tells us, "with which the stones are covered, has been formed by the agency of water, acting upon the iron they contain, which has decomposed or calcined them. The aërial acid has no action in the business. The same kind of rust is found on the basaltes of other countries."

It is not a little amusing to see Dr. Woodhouse soberly use the word *rust*, which, within the limits of six lines, he had condemned as being a "vague term," and as "conveying no precise idea to the mind." An inconsistency this, which we should scarcely have expected from a gentleman of his acknowledged precision of idea and expression.

But what is the "precise idea" which he wishes to "convey to the mind," when he informs us that the stones are decomposed or calcined by the agency of water? Would he teach us that water is a simple substance? or, that all the substances which generally, and which occasionally constitute the combination, have equal agency in decomposing and calcining the stones? If the latter, can he, with propriety, contend that aërial acid, or, in more modern language, carbonic acid, "has no agency in the business?"

If the opinion of Chaptal, that "the oxydation or calcination of metals (and of substances containing metal) is owing to oxygen or vital air,"† be just, while I acknowledge my position to be inaccurate, Dr. Woodhouse will be pleased to confess that his remarks are *also vague and incorrect.*

* Should it be said that the word "rust" is not a technical term, and therefore ought not to have been used on such an occasion, I have only to observe, that I am justified in the use of it by the example of the eminent Chaptal, of Montpellier, whose volumes on chemistry are highly and justly esteemed.

† Chaptal's Chemistry, vol. i. p. 162.

9thly. Dr. Woodhouse triumphantly asserts, "The stones composing the wall are certainly basaltic, as every mineralogist can tell by inspecting them."

This, it will be remembered, was granted, in a paragraph towards the conclusion of my former observations on the wall. This short paragraph, as Dr. Woodhouse appears to have either overlooked or forgotten it, I will here repeat:

"In some parts of Scotland great quantities of basaltes are found, in fragments or single stones, lying on the surface of the earth. The stones in the wall, as well as those on the adjacent hill, may, it is acknowledged, be of a similar species, and may have been thrown up by a volcanic eruption. They must, however, have been collected, and placed in their present situation by the hand of man."

It may here be observed, that should Dr. Woodhouse show, that neither the clay in the region of the wall, nor a mixture of the clay and burnt muscle shells when impregnated with iron, will give the same principles by analysis as the cement; should he give unquestionable testimony that the cement is decomposed or calcined basaltes, it would gain him nothing in favour of the natural production of the wall. For, if the stones, on the supposition of the natural origin of the wall, could have been decomposed or calcined by the agency of water, they certainly could, by the same agency, have been decomposed or calcined, if laid up, without cement, by the human hand. Thus, it is believed, the only plausible argument against the artificial production of the wall is sufficiently obviated.

It will be recollected, that the question in dispute is, not whether the materials are basaltic, but whether the wall is a work of art or of nature. And it is believed, one hour on the spot, devoted to a diligent examination of the form and construction of the wall, will better enable a person to give a just solution to the question, than years employed in analyzing the materials, or in studying the history and character of the basaltes of other countries.

10thly. In his letter to Mr. Hall, Dr. Woodhouse observes, that "the small stones (found in the wall) may have been carried down from the surface of the earth by rain, and deposited in the places where they are now found."

Rain must have possessed astonishing power to "carry down *stones* from the surface of the earth," through a deep and compact bed of sand or gravel, and deposit them in the wall! Surprizing must have been its taste and judgment, to select

stones of a long and handsome figure, and in every instance, of suitable size to fill the crevice, and firmly wedge the wall! Admirable indeed must have been its ingenuity, to convey stones of one, two, or three inches in diameter, through extremely narrow crevices; and with them, fill the various cavities in the middle of the wall! But still more astonishing and mysterious must have been its skill, to convert these small stones, which now are evidently of the same specific character with the wall, into basaltes! Dr. Woodhouse has not furnished us with the chemical process by which this singular transmutation was effected, nor the "precise" philosophical reason why his ingenious artist should have taken the trouble to carry down *stones* from the surface of the earth, and *deposit them*, while the sand was so much more handy, and more easily managed.

In the eleventh place, Dr. Woodhouse, in the same letter, informs us, that "the rock which embraces the wall is granite," and that "he does not suppose the rock was formed after the wall, granite being one of the first formed substances in nature." The rock, he adds, "has probably been burst asunder by the wall, which is, perhaps, of volcanic origin."

With his accustomed facility at quoting authorities in point, he has directed us to Cronstedt's Mineralogy for an instance in which a rock of granite, in Upper Lusatia, "has been rent asunder by a vein of concentric basaltes." Would he not have proceeded less unphilosophically, had he attempted to prove, in the first place, that there is, in fact, a rock "embracing the wall;" and, in the second place, that the rock is granite, before he undertook to assign the cause of its particular situation.*

The fact is, that, so far as the wall has yet been examined, no rock of any description has been found.† The bed of

* It is thus storied of the wise men of a certain kingdom.—Their Sovereign, having called them together, proposed the following question—"Why will not the weight of a vessel, filled in part with water, be increased by the addition of a living fish?" The wise men declared the question to be new, and begged permission to retire, each to his philosophical chamber, where he might go into a thorough investigation of the subject. A few days after, when again summoned, each, in order, read a long and learned discussion of the novel and perplexing question. Various causes were assigned, and many *positive* and *unanswerable* arguments advanced. His Majesty, having patiently heard them through, gravely dismissed them, with a second question for consideration; to wit, "Is it the part of a philosopher to attempt to assign causes for a thing, before he shall have ascertained the *existence of the thing itself?*"

† When I visited the wall, I examined with a particular view to ascertain whether there is a rock in any way connected with it. I found none. And

sand, or gravel, contiguous to the wall, has become, in some parts, more compact, and more approximating in its texture, to the firmness and hardness of rock, than in others. The sand, improperly termed rock, will, even in the hardest part, yield without difficulty to the hoe, or the shovel. It will be useless to tell us of the rock, as we are told of the wall, that it is "decomposed or calcined." Were a rock of granite to be burst asunder by a "vein of concentric basaltes," some positive and indelible marks of the great convulsion would remain. There would be found checks or interstices between the wall and the rock; and these checks or interstices, if filled at all, would be filled with a substance different from the rock. But, instead of this, the sand adheres uniformly and closely to the wall; and contiguous to the wall, there is no such variety, or difference, of substance.

Let us for a moment, however, go on the ground, that the wall *is* embraced by a rock of granite, and examine the reason which induces the belief, that the rock was formed before the wall.—"Granite," says Dr. Woodhouse, "being among the first formed substances in nature."

If this sentence "convey to the mind any precise idea," it is, *that no granite has been formed since the creation of the world;* for if granite could be formed after fifty years, or one year, no reason can be assigned why it could not be formed after *fifty centuries.* And if that be the idea, it is contradicted by the united testimony of Bergman, Fourcroy, M. de Saussure, and the compilers of the British Encyclopædia. These all concur in the opinion, that granite is a combination of quartz, feld-spar, mica, and schorl; that when these substances come together by any casualty whatever, they form the genus called granite; and that the several species are produced by a varied combination of the constituent materials. Some of the authors mentioned have also exhibited specimens of newly formed granite. Hence I deduce the conclusion, that the position assigned as the reason for the opinion, that the "rock was formed before the wall," is wholly incorrect.

In the twelfth place, in the conclusion of the reply, Dr. Woodhouse *wisely* remarks, "that the supposition that the North-Carolina wall has been constructed by an enlightened antediluvian nation, is as unphilosophical as the belief of some of the common people of Scotland, that the cave of Fingal is

Dr. Newnan, of Salisbury, North-Carolina, a physician of the first respectability, and a member of the American Philosophical Society, who has devoted more time and expense to the investigation of the wall than all others collectively, has lately assured me that no such rock has yet been found.

artificial, and was built by a race of giants, for their celebrated Chief, Fion-Mac-Cool, the father of Ossian."

This satirical and groundless sentence, I am fully sensible, does not deserve a serious answer. In ordinary circumstances, I should pass over it with the neglect it merits. But, as I am compelled to combat the opinions of a philosopher on a philosophical subject, I choose to examine *this profound* remark, to penetrate through the splendour which surrounds it, and expose to the light its incorrectness and absurdity.

On the cave of Fingal I have already made sufficient comments. It is an object, to construct which far exceeds human power. It is formed on a scale too extensive, too sublime, too rude to admit the belief, that it was produced by the efforts of man. It has not an impression of the human hand—it has not an appendage which betokens the work of art; and none but the peasant as uninformed as the brute in his field, ever supposed it artificial. Of course, the belief attributed to "some of the common people of Scotland," is indeed strictly "unphilosophical."

But has this any application to the supposition that the wall was constructed by an enlightened antediluvian nation? I well know, that some of the "wise men of the world" consider the supposition of a *general deluge* as unphilosophical. I equally well know, that this supposition has been adopted by the most useful and distinguished philosophers the world has yet seen. While I find myself supported by such illustrious characters, I willingly hazard the imputation of being "unphilosophical." I hesitate not to declare my *full and decided assent* to the testimony given us in support of the general deluge. On this ground, it cannot, with truth, be pronounced unphilosophical to suppose, that, previous to the deluge, the western, as well as the eastern continent, was inhabited. And if inhabited, where is the absurdity of the supposition, that the wall was then constructed; and that in the deluge, the face of the country was in some degree changed, and the wall covered with earth?

Let it again be observed, that, although I do not possess sufficient sagacity to discover the extreme absurdity of the supposition, it is not, however, my belief, that the wall was formed before the deluge. Nor is there in the remark, which appears unfortunately to have given some inquietude to Dr. Woodhouse, a suggestion of the belief.

I am, Gentlemen, with the highest esteem,
Your obedient and humble servant,
ZECHARIAH LEWIS.

New-York, February, 1802.

ARTICLE IX.

REMARKABLE CASES *of* MADNESS: *Communicated by Dr.* JOHN VAUGHAN, *of Wilmington (State of Delaware), to Dr.* MITCHILL.

Wilmington, March 17, 1802.

DEAR SIR,

IN presenting you with the following account of a family-mania, I am flattered with the belief, that it will be ranked amongst the wonders of the nineteenth century. When witchcraft and conjuration swayed the sceptre of public opinion, the narration of this fact might not have excited much attention; but in the present day it will be deemed an interesting evidence of the frailty of the human mind.

The family in which this infectious mania occurred live a few miles north-west of this borough, and have long been esteemed industrious, orderly people, until August last, when they became infatuated with the notion of being *possessed with an evil spirit.*—Their phrenzy is thus described by a respectable farmer who was an observer of a part of the tragedy:

"On the 3d of August, 1801, S— S— came to his mother's (who had been insane for some time) to settle some business with her, when she caught him round the neck, and kissed him, telling him he should become a preacher of the everlasting gospel, when *he* immediately became crazy, and thought he was inspired. On the evening of the next day she kissed him again, and also kissed two other sons, two daughters, and two daughters-in-law, and the whole of them became frantic immediately.

"On the morning of the 5th I was sent for in great haste, when I found the whole family in the utmost confusion, believing they were possessed with an evil spirit; adding, that their mother had died a week before, and satan had entered into her body, and communicated himself to the rest of them by *a kiss!* Under this impression, they had dragged the old woman out of bed, and nearly beaten her to death. After a considerable struggle I rescued her from them, and laid her in bed. They then endeavoured to set the house on fire, to consume the tormenting demon in the image of their mother; but several of the neighbours collecting, we se-

parated them, and prevented further mischief. In the course of a few days they all became peaceable and rational but John, who afterwards became your patient.

"WILLIAM SIMONSON."

Of the truth of these circumstances, related by Mr. Simonson, there can be no doubt. I have, for many years, known him to be a man of unquestionable integrity, and highly respected in his neighbourhood; and, as he lived within a few rods of the infected family, I applied to him for an account of the fact.

John S—, who is mentioned as becoming my patient, remained irascible after the recovery of his brothers and sisters, and was confined in the Paupers' Infirmary for a few days, where he was freely blooded without relief; and on the tenth day of his disease he was brought to the house of a relation in this town.

I was called to see him on the following day, when I found him chained to the floor, with his hands tied across his breast —clothes torn off, except the shirt—his feet and elbows bruised considerably—and his countenance, grimaces, and incoherent language, truly descriptive of his unhappy condition. As he was free from fever, and his pulse not tense nor preternaturally full, I deemed this a fair case for the application of cold water, as recommended by Dr. G. G. Brown, in *apoplexia mentalis*, or *delirium sine febre*. (See Med. Rep. vol. iv. p. 209.) Accordingly a linen cloth was wrapped round the head, and wetted every few minutes, by a sponge, with cold water, for five hours, without any sensible effect.

On the twelfth morning of the disease it was resumed, and continued until it induced chilliness; and as it produced no relief, his friends became impatient of a remedy apparently simple; and on the next day his head was shaved, sixteen ounces of blood taken from the arm, and a cathartic exhibited. The succeeding night he slept tolerably well, but remained incoherent; and on the fourteenth morning a blister was applied to the scalp, and the purge renewed, which relieved him so far as to enable him to go home, and attend to the business of his farm. He, however, retained some idea of his previous delusion, and believed he was commissioned to be a preacher, and entitled to support from the public; but the infatuation gradually wore away, and he is now perfectly restored.

The rest of the family remain well. The old woman *actually* died in a short time after the melancholy scene of confusion before-mentioned.

This case affords ample source of speculation to the metaphysical pathologist who wishes to explain the morbid affections of the mind and body. For my part, I confess myself much at a loss to attempt any explanation of this extraordinary form of mania, independent of any previous bodily disease. Dr. Rush denominates mania a state of fever, but I presume the present affection is an exception to that doctrine.

It may be observed that the mother had been, for some months, in a chronic state of insanity; and as her children, no doubt, were much interested in her condition, their affections wrought up, at this juncture, by a final settlement of business which impressed them with apprehensions of her being irrecoverable, together with the predisposing force of prejudice and credulity, may have favoured the fanatical impression.

I find, on a minute inquiry of some of the connections of the family, that the whole of them embraced the idea of John's being commissioned to preach the gospel, and they accordingly initiated him in the functions of a minister, by the performance of the ceremonials of their church.

That physical something, usually stiled sympathy, which is considered as the source of compassion, which is excited into action by the sight of our fellow creatures in distress, may be susceptible of morbid influence beyond satisfactory explanation. It is well known that convulsive affections have been induced by the sight of persons labouring under them, and heroes have been known to weep at the impressive spectacles of destruction made by their own victorious arms, on the reflection, that such might be the fate of their own country, or their own friends.

The phrases, *sympathetic action*, *consent of action*, and *associated action*, are becoming familiar in medical language; but, are they not rather medical expressions used to illustrate a connection or relationship between the different parts of the system, instead of designating any peculiar law of the animal economy? We find that sympathetic or associated actions vary with the states of the system. Pestilential miasmata will at one time excite vomiting; at another time muscular debility, or languor; and, perhaps, a third time febrile action; and are frequently inefficient in producing disease of any kind, from the non-concurrence of a predisposing cause. Thus also are mental impressions varied by incidental states of the system. At some times the mere sound of death will excite horror, and at other times the devastations of pestilence are viewed

with as much indifference as if we were invulnerable. And, upon an extensive view of the dispositions and actions of mankind, it would seem as if some persons were constitutionally devoid of sympathy, and those tender affections which ennoble the character of man; or, from an unfavourable hebetude, are insensible to those impressions which frequently torture the minds of more susceptible beings. Therefore, predisposition of body, and sympathy of mind, probably deserve an equal rank in the formation of corporeal and mental diseases.

Admitting the stomach to be the centre of association in the establishment of febrile diseases, may not the *sensorium commune* be entitled the centre of association in mental disorders? The connection of the animal functions, and their general dependence on the state of the stomach, in particular, are not more evident, in my opinion, than the relation subsisting between the *sensorium commune* and the internal senses, and the dependence of the latter on the impressions made on the nervous sensorium, or common receptacle.

The immediate influence of the mind on the nervous system, and the agency of the latter in the operations of the mind upon the system, render it probable that they are concerned in the formation of that sympathetic orgasm which I suggest as the predisposition to mental disorder.

The translation of diseases from the blood-vessels to the brain and nervous system, and the transformation of febrile action to mania, also evince that physical relationship so frequently mentioned by physiologists, as connecting mind and body, and subjecting each to a participation in the morbid affections of the other. This intimate connection, however, does not invalidate the doctrine of separate orders of idiopathic disease. Fanaticism appears to be as much a primary mental disorder, as febrile action is a vascular disease.

In three cases of fever, which occurred last autumn, the transformation to mania was complete, and perfectly consonant with Dr. Rush's theory of the maniacal state of fever. In the first case a remittent form of fever became an intermittent hysteria. After a slight nervous agitation the patient would become frantic, alternately laughing and crying for several hours. The paroxysms resembled intermittent fever in the regularity of recurrence and the term of duration; and were, accordingly, removed in a few days, by the use of asafœtida and Peruvian bark in the intermissions.

A second case of remittent fever terminated on the fifth day,

in a moderate sweat; and the sixth day I pronounced my patient free from disease, and recommended a convalescent regimen. On the seventh day I was called to him again, and, to my great surprise, found him maniacal, with a feeble and frequent pulse, and cool skin. Suspecting the change to be a translation of morbid action from the vascular system to the brain, I endeavoured to relieve the latter by the application of cold water to the head for 36 hours, without any effect but an occasional shuddering sensation. Afterwards I attempted a revulsion of excitement by the application of blisters to the scalp, hands and feet, with no better success; and, finally, to excite counter action in the stomach by stimulating draughts. After remaining *in statu quo* for several days, my patient was put under the care of one of *Mesmer*'s disciples, who professed wonders, and promised no less; and with earnest wishes for his better success, and strong apprehensions of disappointment to the relatives, I submitted to the transfer: and the result confirmed my expectations.

A third case, to which I was called in the last stage of the disease, was similar in progress and termination to the preceding.

It is also worthy of remark, that the diseases of last autumn affected the brain and nervous system in an astonishing manner. The most trifling casualties sometimes produced delirium, and insanity and suicide were, throughout the country, frequent beyond example. I have sometimes queried, whether there might not have been an epidemic constitution of atmosphere, resembling the pestilential constitution of the air described by Sydenham, and believed, by many, to have existed in our country for some years past. The *maladie Anglaise* is imputed to the influence of a November atmosphere.

In consequence of Dr. Miller's reasonings on the morbid functions of the stomach, I refer these facts and observations to him; with the simple query, whether the fanaticism of the S— family be accountable for on the sympathetic connection existing between the stomach and nervous system? or whether it be not exclusively a mental affection?

I am, dear Sir,
Yours, &c.

JOHN VAUGHAN.

ARTICLE X.

Facts *concerning the* Efficacy *of* Alkalies *in* Diseases *of the* Alimentary Canal: *Communicated in a Letter from Mr.* Joseph Bringhurst, *jun. of Wilmington (Delaware), to Dr.* Miller.

In glancing over a page of the last number of the Medical Repository, my attention was arrested by an account of accidental cures of the disease termed *bilious colic*, by means of oils and alkalies. I can furnish additional evidence of the benefit of alkalies in that disease, and in those which arise from the same cause.

In the year 1793 I was grievously afflicted by dyspepsia, and frequently attacked by violent colic. As I was particularly attentive to my diet, I informed my physician, Dr. Foulke, of Philadelphia, that I had observed those attacks of colic often followed an acid taste in my mouth, and were uniformly produced from my eating the smallest portion of pickle.—These circumstances led him to a successful mode of practice in my disease. He combined one drachm of pure pot-ash with four ounces of water and a few drops of peppermint oil; of this solution he directed me to take a tea-spoonful every ten minutes, until I obtained relief. I complied with his direction, and always found ease in a few minutes after I had taken the alkali. A friend who laboured under dyspepsia informed me that he always found bread containing pot-ash more suitable than any other for his stomach.

These facts induced me to make inquiries of persons afflicted by dyspepsia, respecting their diet and medicines. They uniformly agreed that every thing *sour* increased their sufferings; and yet some of them used the sulphuric acid as a tonic. I informed them of the success which attended my use of alkalies; and stated, to some persons, an interesting fact, as a confirmation of the great utility of alkaline draughts in dyspepsia. I had, in the year 1795, eaten two or three pears: in less than one hour I felt my stomach oppressed by a sensation of immense weight. To raise my arm appeared, to myself, a gigantic labour. Two hours had not elapsed, when I became pale, exhausted and fainty. My friends, at whose house in the country I was visiting, were much alarmed. They entreated me to take spirit, to revive my powers. I rejected their advice, and prescribed a strong dose of soot tea. Two

spoonfuls (whether tea or table spoons I do not recollect) of soot were gathered from the bottoms of the pots, and mixed with about one gill of warm water. I took the whole at one draught; and in half an hour my stomach was relieved from all sensation of weight; but I was distressed by a sense of weariness. I conjectured that my stomach had been so much harassed by the pears that it could not properly perform the work of digestion; I therefore took large draughts of warm water, and the whole contents of my stomach were discharged. When this task was accomplished, although I was weak, my feelings were pleasurable.

These circumstances almost necessarily urged me to inquiries into the qualities of alkali as a medicine, and the kinds of diseases in which it might be useful. As I am not a physician, it cannot be supposed that I should use technical terms with entire propriety; I shall therefore endeavour to avoid them in the brief account which I am about to give thee of some few instances in which I have successfully used alkalies. I should premise that I am an apothecary, and consequently all my practice has been among poor people, who could not afford to pay a physician. A poor woman, during several weeks, laboured under a fever and ague. She became so much enfeebled that she could scarcely walk. Her aspect was cadaverous. She complained of great weight about her heart, and a sense of suffocation. Peruvian bark irritated her stomach. I suspected a vitiation of the fluids of her stomach, and conjectured that acidity was the chief cause of her sensations. One quarter of an ounce of magnesia, taken daily for three days, relieved her from the weight and sense of suffocation, and then bark completed her cure. In fever and ague I always combine the alkali, vulgarly called sal. tart. with bark. One ounce of bark, and half a drachm of the alkali, frequently cure persons in two or three days.

About six weeks since, a man of this borough sent his wife with a request that I would call to see him. I complied with his desire, and found him very ill. He informed me that he had sent for me with the hope of receiving benefit from my advice. I observed, in reply, that I was not a physician, and as he was very ill, his disease required a person of more skill than myself. He urged me to prescribe for him—in truth, he almost compelled me to do so. He informed me that he had been ill for several months, and that, during the six last weeks, he had been wearing away with a violent flux. Large quantities of blood came from him two or three times daily,

and he was obliged to use the close-stool from ten to forty times during each twenty-four hours. His evacuations of blood were always preceded by intense and cutting pains in his abdomen, and sensations which impressed him with fears of his hip-bones tearing asunder. From the colour and fœtor of his evacuations, and the cutting sensations of which he complained, I suspected a daily generation of acid in his stomach and intestines, and therefore resolved to administer alkalies. I immediately combined two ounces of pure soda with 32 grains of ipecacuanha. I divided the whole into sixteen doses, and ordered the patient to take three daily. I combined the ipecacuanha with the hope that it would float on the fluids of his stomach; and after the soda had united with the acid of his stomach, and formed a purgative salt, the powder would follow it, and operate as a tonic on his stomach and intestines. —The man is now in perfect health. When he had taken one ounce of the soda thus combined, his stools were diminished in number, quantity and appearance. They began to assume a natural colour, and were free from blood. In ten days he was able to walk about, and in less than three weeks he thought himself well. I charged him to eat simple food, and avoid such meats as would oppress his stomach. He foolishly transgressed, by eating sausages fried in lard, and brought on his pains and bloody stools. Three doses of soda relieved him; and, by care in his diet, he is now in perfect health.

I have some weeks ago introduced the vaccine disease into Wilmington. I have had eighteen patients, not one of whom complained of sickness.

I am, in haste, with esteem, thy friend,

JOSEPH BRINGHURST, jun.

ARTICLE XI.

REMARKS *on Dr.* PRIESTLEY'S OBSERVATIONS *relating to the* SENSE *of* HEARING, *published in the Medical Repository, Vol.* iv. *p.* 247: *Addressed to the Editors.*

GENTLEMEN,

I PERUSED, with great pleasure and satisfaction, the observations of that ingenious and learned philosopher, Dr. Priestley, relating to the sense of hearing, published in your valuable work. I remember to have made similar ones about

two years ago, but did not attend to them at that time; and I presume that an explication can be afforded to the various phenomena he mentions to have remarked, whilst attentively listening to the beating of a watch under his pillow. He observes that, "besides the sound that we may call *ticking*, produced by the striking one piece of metal against another, *he* distinctly *heard* another sound, coincident with it, resembling that of a bell, but generally as at a considerable distance. It *was*, however, sometimes louder than that of the ticking."

This, I think, can be explained in the following manner:—When holding a watch to the ear, and listening attentively, the same sound can be heard, regularly coinciding with the beats of the watch. This, I presume, is occasioned by the striking of the teeth of the crown-wheel against the pallats fixed on the verge of the balance. These pallats are made of steel, and are very thin. This being elastic, is likely to be thrown into a small vibration by the percussion of a hard body, such as the wheel is. This *ringing* (if I may be allowed the expression) can be heard very regularly when the watch is held to the ear, and, I think highly probable, is the necessary effect of the ticking, though the additional bell-like sound is not perceptible to an inattentive observer. As there are *two* pallats, consequently there will be two additional sounds produced, though one is always louder than the other. This Dr. Priestley remarks in his third observation. But he concludes that this additional sound is *not* produced necessarily by the ticking. The reasons he adduces in support of this opinion are expressed in his fourth observation; but I think it is very probable that the interruptions of the sound that he mentions may be produced in the following manner.

It is well known to watch-makers, that it is exceedingly difficult to cut the teeth of a small wheel in a watch of even dimensions, and their distances from one another accurately equal. This unevenness of the teeth of the balance-wheel, then, will consequently produce an inequality in the motion and force of the wheel against the pallats of the balance. The pivots of the balance also may move, in a small degree, loosely in their pivot-holes, as they cannot be fitted accurately, on account of their diminutive size, without producing an unnecessary degree of friction. Hence I think it very probable that the pallats and balance-wheel may sometimes be in such a particular position, in respect to one another, that the bell-like sound may be produced in an irregular manner, being louder sometimes every other beat, and sometimes not for a consider-

able time; which circumstance Dr. Priestley expresses in his fourth observation. Two irregular sounds may be observed for the same reason. But I think there is another circumstance to be attended to in hearing these sounds, though I do not lay much stress on it. Dr. Priestley laid his watch under his pillow. The sound is generated between the pillow and bed, and conveyed through the interstices of the feathers to his ear. Now, in the attitude of listening, as the tension of the tympanum of the ear is increased, and, consequently, is more liable to be thrown into vibration by the least movement of the head, I think that the noise produced by the motion of the blood in the head will often interrupt the *regular* succession of the sounds. Of the truth of this it is in almost every person's power to satisfy himself. Besides, a person who wishes to listen attentively will often make a very slight movement of his head on the pillow, in order that he may hear the sound more perfectly. The noise produced by this motion will prevent him from hearing the beat *perfectly* for some time: and I think it probable that the medium of the communication of the sounds may be a little altered by such a movement. This will delay such a communication, and probably interrupt the sound for a short time. These circumstances, combined with those above-mentioned, may produce that irregularity of the additional sound which Dr. Priestley mentions in his fourth observation. The rest of that observation is, perhaps, merely a personal affection; I need not, therefore, say any thing concerning it.

But why (some will say) cannot this interruption of the additional sound be perceived when the watch is held to the ear? I answer that it is very possible it may take place, but the difference or irregularity of the bell-like sound may not be so great as to be then perceptible, especially to an inattentive observer: but when the watch is placed under the pillow, the sound being confined to a small space, and the medium through which it is conveyed being *denser* than before, it may become more perceptible to the ear, and any variation that may take place in the additional sound will *then* be remarked more sensibly.

In the investigation of any subject, all the circumstances appertaining to it ought to be considered. This, I hope, will serve as an apology for thus dwelling on the foregoing remarks.

The sixth observation Dr. Priestley makes, I presume, may be explained from the reasons I mentioned above, as there

may be more inequality in one watch than in another. As I know nothing of *music*, I cannot determine the harmonic proportions of the sounds Dr. Priestley heard, but I remarked that they were generally lower than that of the ticking, but sometimes much louder. I suppose the additional sound is greater in a vertical than in a horizontal watch, as in the *former* there is more force applied to the balance, and the *pallats* are constructed in a different manner.

From the foregoing observations I therefore consider the sounds above-mentioned to have originated in the construction of the watch (and Dr. Priestley's sixth observation, perhaps, proves this assertion), and not in any peculiarity in the nature or unknown quality of sound, as (if I mistake not) Dr. Priestley concludes to be the case.

The above remarks, Gentlemen, I submit, with diffidence, to your consideration; and if there are any errors in them, I hope you will not censure me unjustly, but remember that they are errors of one who is actuated by the sincerest motives for the advancement of knowledge and truth. "*Humanum est errare.*" I do not consider the foregoing to be a complete explanation of all the phenomena that are observable, but I hope the few hints above suggested will induce persons, who are far more capable than I am, to investigate this interesting subject in its fullest extent.

With respect and submission,
Gentlemen,
I remain yours, &c.

O.

Philadelphia, March 6, 1801.

P. S. The reason I did not, Gentlemen, forward this to you before, was, I expected that in your fourth number I should see an answer to Dr. Priestley's observations, written by some one of your numerous valuable correspondents; I therefore withheld it: but as I have found the contrary to be the case, I have now ventured, with diffidence, to send you the above crude remarks, which may, perhaps, suggest some hints to some of those gentlemen who correspond with you, for the investigation of the subject to which Dr. Priestley has drawn their attention.

I remain yours, &c.

July 10, 1801.

ARTICLE XII.

PRACTICAL REMARKS *on the* INTERNAL USE *of* CARBONATE *of* POT-ASH. *By Dr.* DANIEL, *of Falmouth (Virginia), in a Letter to Dr.* MITCHILL, *dated March* 29, 1802.

SIR,

I HAVE lately put to the test of practice your theory respecting morbid affections produced by septic acid generated in the intestinal canal. As the result has been highly satisfactory, I take the liberty, though a stranger, of addressing you upon the subject.

I think it necessary to premise, that, during the last summer and autumn, the inhabitants of this place, and of the country for some distance around, were nearly exempt from the usual intermitting and remitting fevers of those seasons; and this exemption extended even to those living near marshes and water courses. The only disease which engaged much of my attention was a diarrhœa of a singular kind, and that was so general that I believe there were few persons who did not suffer more or less from it during the time of its prevalence. —I shall not trouble you with a minute description of this complaint, but mention some of its most remarkable symptoms as sufficient for my present purpose. The most uniform and characteristic feature was a very white, chalky appearance of the fæces; for in not one single instance did I observe the slightest tinge of bile, but, on the contrary, a total absence of that fluid. The dejections, though frequent, were not very liquid; and my patients complained, in passing them, of a hot, smarting sensation at the end of the rectum. The febrile symptoms were seldom high, and in some cases entirely absent, though the pulse generally was stronger than would have been expected, considering the degree of languor and depression of strength which usually attended. In some instances, where the appetite became very much impaired, and the stools very frequent, they were mixed with mucus and blood; but this was not a common occurrence. I think it remarkable that most of the affected persons complained of uneasy sensations in the region of the liver; but none of their skins discovered a bilious tinge.

This disease was in very few instances fatal, but extremely obstinate and distressing. It did not end with the autumn, like the complaints of that season, but continued to show itself till the end of January; since when I have not heard of it. I was myself among the first attacked by it; and, in addition to the symptoms mentioned above, was troubled with frequent eructations of air, which diffused a very hot, keen and disagreeable sensation upon the fauces and mouth; but differing from what is usually called heartburn.

My first curative attempts upon this epidemic were very unsatisfactory indeed. I tried the whole list of remedies usually given in similar affections; such as emetics, cathartics, anodynes, bitters and astringents; but all to little purpose; the symptoms generally returning as soon as the action of the medicines was over.

My chagrin at being so often baffled in my attempts to cure a disease attended with no very formidable symptoms, excited a closer investigation of its nature; and happening to turn my attention to your letter to Dr. Percival, of Manchester, published in the first volume of the Medical Repository, my perplexity respecting its exciting cause and treatment vanished. Your reasoning proved fully to my mind, that, from the nature of its usual contents, there must be a constant disposition to the evolution of septic acid in the alimentary canal whenever the digestive powers are impaired; that nature has, in her bounty, given us a corrective of this process in the alkaline quality of the bile; but whenever this corrective is wanting, the production of that acid must, of course, be the consequence. This doctrine was certainly a happy one, when applied to the disease of which I have been speaking. My earliest observations upon the symptoms convinced me that there was a torpor in the secreting powers of the liver, and a consequent deficiency of bile; but this led me no further than to the use of bitters, &c. as substitutes for that fluid. It was reserved for you, Sir, to point out the necessity of saturating the acid poison which aggravated the symptoms and protracted the cure. As soon as this necessity was impressed upon my mind, my difficulties were at an end: for, except giving calomel occasionally, with a view of rousing the liver, I had nothing more to do than to give, during the day, frequent doses of carbonate of pot-ash dissolved in chamomile tea, and an anodyne at night. In delicate stomachs the alkali was joined with citric acid. Under this treatment the disease not only lost its obstinacy, but became a mere trifle;

and I think my acknowledgments due to you for the relief which my feelings experienced on the occasion.

Before I close this letter, I must beg leave to draw your attention to a fact which has come under my observation: It is the singular effect which opium has upon two gentlemen of my acquaintance. They are brothers, and their habits nearly the same. They have both informed me that opium, as is usual, suspends the action of their intestines for some time (never less than twenty-four hours), and then they are seized with a brisk diarrhœa, which continues from four to six hours. The fæces discharged at that time are quite white, or, to use their own words, "they resemble thickened milk, except being rather more liquid." But the most remarkable circumstance is, that the discharges are of so active a quality as to excite the most insufferable pain, and completely excoriate the anus. One of them said, "he did not think *aqua-fortis* would hurt him worse," and the pain had often been so great as to bring out a clammy sweat upon his skin and induce faintness.

In attempting an explanation of this phenomenon, I have supposed the opium to possess, in those two persons, a specific power of suspending, for a time, not only digestion, but also the secretion and transmission of bile to the stomach and intestines; that, during this suspension, a considerable accumulation of septic acid takes place, and excites a commotion in the intestines, which does not cease until they are emptied; or the liver shakes off its torpor, and throws in the necessary quantity of bile to correct the acid.

To put this reasoning, in some measure, to the test of experiment, I prevailed upon one of the gentlemen to submit to the effects of a dose of opium under my directions. Early in the evening I gave him a dose of a solution of sal absinthii, and at bed time I gave him another, with a grain of pure opium. He repeated the doses of the solution several times during the fore part of the ensuing day, and in the afternoon it stimulated his bowels to gentle action. The stools were not quite so white as they had formerly been after taking opium, and entirely destitute of their sharp, corroding quality.

I think it would be superfluous to offer any opinion upon this experiment, as the result appears to me to speak plainly for itself.

I believed the above facts to be corroborative of your theory,

and have therefore troubled you with them, and I should feel honoured in hearing that you concurred in that belief.

I am, with profound respect and consideration,
Your obedient servant,
JOHN MONCURE DANIEL.

P. S. I am inclined to think that the torpor of the liver mentioned above, as attending our late epidemic, was a very general thing, though I can ascribe it to no particular cause. I do not at present recollect, in the whole of my practice last summer and autumn, to have met with more than two cases of sickness attended with a redundance of bile, and they were among the few who escaped the prevailing bowel-complaint.

J. M. D.

REVIEW.

ART. I. *Physical Investigations and Deductions, from Medical and Surgical Facts; relative to the Causes, Nature and Remedies of the Diseases of a warm and vitiated Atmosphere, from Climate, Local Situation, or Season of the Year: together with an Historical Introduction to Physianthropy, or the Experimental Philosophy of Human Life; that of Diseases, and also of Remedies. By* William Barnwell, *M. D. formerly Surgeon in the Employ of the Hon. East-India Company of London.* 8vo. pp. 459. *Philadelphia.* Woodward. 1802.

WHEN men of talents and experience condescend to record the facts which they have witnessed, or to write the details of events in which they have been actors, their narratives are entitled to more than a common share of regard. If, on submitting their works to the public eye, an opinion should be entertained, by those who peruse them, that the authors were good and discriminating observers, and related what they knew with truth and candour, it seldom fails that respect and honour are attached to their names. They who enlarge the dominions of Science, and make their acquirements tend to lessen the physical ills, and improve the moral excellence of the human race, are reformers indeed.

The volume now before us was announced, our readers remember, in page 238 of this volume. The writer, who has journied much by land and by water, and visited the four quarters of the globe, has taken the pains of arranging his observations, and submitting them to examination in print. During twenty years of his life, devoted to study and practice, he has been employed in gathering the materials. These have been principally derived from warm and unhealthy regions. And the objects in contemplation were promotion of science and benefit to mankind.

The book contains several essays or disquisitions on physical and medical subjects. Though these are in some respects analogous, there is little direct connection between them. Each is so much an entire performance, that it might have been transposed from the place it occupies to another part of the volume without detriment. Or each of the great divisions

might have made a distinct publication or pamphlet by itself. It appears to us judicious that Dr. B. has embodied them in one cover, and offered them in that collected form.

The principal heads under which the materials are arranged, are, 1. Physical Geography, reaching to the 53d page. 2. Medical Topography, extending to the 95th. 3. The Nature of Infection, spreading to the 119th. 4. Analogies of Medical Surgery, occupying all the pages to the 165th. 5. Then follows a Dissertation on Bilious Affections and Diseases of the Liver, which ends at the 245th page. 6. And after this a Treatise on Diseases of the first Passages, Choleras, Diarrhœas and Dysenteries, which terminates at the 300th. 7. An History of periodical and continued Fevers, under the Denominations of Intermittent, Remittent, Typhous and Pestilential, to the 399th inclusive. 8. An Historical Introduction to Physianthropy runs to the 457th. And, 9. The two last pages are entitled, the Physical Principles of Medical Science, &c. and a Synopsis of the Genera and Species of the principal Diseases of the Human Body. Such are the leading titles of the articles contained in Dr. B.'s volume.

But it is our business to examine these pieces a little more nearly. We shall take them in the order which they hold in the book. And here the specimen of physical geography presents itself first to our review.

After a few pages of introductory remarks, the author proceeds to an investigation of the causes of the remarkable difference which exists between the temperatures of the United States of America, and the corresponding parallels of latitude in Europe. In doing this he has brought together a great number of facts: he has disposed them in an interesting manner, and given a striking and enlarged view of the currents in the Atlantic Ocean; how they are influenced by winds; how, in their turn, they operate upon the atmosphere, and by this means affect the temperature of the land, whether continent or island, in their neighbourhood. We were pleased to see him give full credit to Dr. Williamson and the Abbé Mann, for their labours and researches on this subject. A partial difference with them in opinion is stated; but this is done in the most liberal and respectful manner; and the reasons and considerations on which it is founded are delivered in impressive terms. This will appear from the following extract, which seems to us a favourable specimen of Dr. B.'s explanation of the great movements of atmosphere and ocean between the western and eastern hemispheres. (p. 32.)

"We come again to take a view of the currents in the northern parts of the ocean—their causes and effects on the temperature of different countries; but in the first place we must recapitulate those currents caused by the trade winds, and their effects in various places. These winds, prevailing all round the globe, cause currents in the ocean, which *extends* [extend], as we have shewn, in many parts, far beyond the limits of the winds; for they prevail near many coasts where the trade wind never reaches, both to the southward and northward. Now, in consequence of the winds in the Indian Ocean, there is a constant current sets past the Cape of Good-Hope, and the southern parts of Africa, from east to west; for the trade winds in the Pacific Ocean *sets* [set] the surface of it in motion to the westward; so that, between the southern part of the continent of Asia, and the main land of New-Holland, there is a constant current sets to the westward through the eastern islands; but it is stronger, both here and on the southern part of Africa, at some times of the year than at others; but never prevails in the opposite direction from west to east; but from India towards Africa there is always a slow current within the limits of the trade winds; and at the Cape it often runs rapidly, even against strong storms from the westward; for in this direction we have been carried past the Cape, at the rate of two miles an hour, against the wind, when lying to, which is a clear proof of the force of the steady trade winds against uncertain storms, &c.

"From the Cape towards the island of St. Helena there is always a current, which is one reason why that island is often past, or overshot in the night. By this course the waters of the Indian Ocean find their way into the Atlantic; but the trade wind prevailing here also, sets the waters of the Atlantic in motion to the westward; or from the coasts of Africa towards America, where being intercepted in their course; that part which is to the southward of Cape St. Augustine, in Brasil, about the ninth degree of south latitude, is divided by this most eastern part of America; that part which is to the south of this takes its course southwardly, along the eastern coast of South-America, all along which it has been traced, and even through the Straits of Magellan, and into the South-Sea, and probably past Cape Horn. But that part of the current of the Atlantic which is northward of Cape St. Augustine, is totally intercepted by the American continent; and, by the direction in which the continent is, the current takes its course towards the Gulf of Mexico, where it is in

a manner dammed up by the continent of North-America stopping its progress to the north-west, and the trade wind behind forcing it forward. Here we may observe that there can be no doubt but the water of the gulf is several yards higher than that of the South-Sea, and that the water of the Red-Sea is also higher than that of the Mediterranean, upon similar principles; the water being forced in that direction from the east. But this was a prevailing opinion in very ancient times.

"The direction of the western coast of Africa would seem to direct the current of the Atlantic towards the Gulf of Mexico also; where being pent up, it has no other way left to escape but past Cape Florida, between which and the island of Cuba it forces its way; and having passed this Cape, it bends its course to the northward, between Florida and the Bahama islands; from whence it stands on to the northward, along the southern parts of the United States; from whence it takes a north-east direction, until it vanishes about lat. 42 deg. N. towards the banks of Newfoundland: there is no doubt but it is a very great cause of the fogs which prevail on these banks, together with the cold air which it commonly meets with here; as also another current which sets southwardly, along the coasts of Greenland and Labradore, from Davis's and Hudson's Straits, &c. and both will certainly cooperate in causing the uncommon fogs met with here. These two currents intercepting each other, are supposed, with great probability, to accumulate the subsistence for the immense numbers of fish which are found here, in the same manner as banks are formed; and large quantities of fish are found at the mouths of all great rivers, where their currents are intercepted by the sea, &c.

"Although the Gulf Stream runs in some of its most rapid parts, between the Bahama islands and Florida, between two and three miles an hour, to the northward of that strait it runs slower, and spreads wider, to about 40 or 50 miles. It is very evident that this water, forcing its way from a warm to a colder climate, will carry much of its heat with it into the colder parts of the Atlantic, as has been satisfactorily proved by Dr. Blagden; and although a part of it which is most southwardly, and in which that substance called the gulf-weed floats, returns again to the southward, and performs a circular course back again into the gulf; yet the far greatest part of it takes a different course, and is driven by the west winds towards the northern coasts of Europe; for there are

seeds of vegetables found yearly on the western islands of Scotland and Ireland, which are produced in the West-Indies alone; which is a convincing proof that the waters of the Gulf Stream also take their course in that direction; and we shall find that they have a great share in moderating the coldness of the European winters, but particularly in preserving the mild temperature of the northern parts of the Atlantic, which is clear of ice upwards of 10 deg. farther towards the pole than any other ocean or sea in the world; for here are two phenomena with which we are acquainted, not found in any other part of the world—the Gulf Stream, and the mild temperature of the Atlantic: for we shall find, on investigation, that a current sets to the northward, along the western coasts of Ireland and Britain, towards Norway and the North Cape, and by this means preserves the warmth of these seas; so that Europe is under many more obligations to America for her mild winters than it was formerly thought she was, particularly to the isthmus of Panama. But how it happens that the gulf-weed should so universally take its way to the southward, is another consideration. It may be impelled by a law of the motions of substances floating on water, similar to that which we often see take place in rivers, or other streams of water, wherein the lighter floating substances are collected together; but, however it is brought about, it is certain that the Gulf Stream, aided by another circumstance which we are to mention presently, is the cause of the temperature of the north-east part of the Atlantic being so very mild above all other seas in similar latitudes. This is a *phenomena* [phenomenon] which has scarce ever been attempted to be explained; but we have no doubt but this explication will prove satisfactory; for although cultivation has been allowed to make the temperature of the land milder in Europe, yet that was never even suggested to extend its influence far into the ocean.

"The Atlantic, we see, keeps broad and bold, quite away to the north pole perhaps, or to eighty-one, as it has been explored so far by the whale fishers; whereas the Pacific Ocean is contracted at about 66 deg. north, to a narrow strait of fourteen leagues between the continents of Asia and America. Now let us begin our course with the west winds in the Atlantic, where these winds are rendered mild by passing over this great body of fluid water, and receiving part of its heat, from the agitation which it causes in the ocean, for it comes upon the British isles as mild as it left the great ocean; so

that they have the mildest winters of any, and next the continent of Europe, which is so mild as to be habitable to near 70 deg. north, and fertile countries, and populous, with large cities to above 60 deg. This must be from its vicinity to the western breezes of the Atlantic. Now these winds hold on their course to Siberia, and all that northern country of Tartary. But China being on the very eastern side of the old continent, the west winds must pass all over the continent of Europe and Asia before they can reach it, and are, therefore, much cooled by the frozen regions of great extent over which they pass, as this is the greatest body of land in the world; of course the rigour must be increased in proportion, from the causes we have already mentioned, and therefore the east side of the old continent is so very cold as to be scarce habitable to 50 deg. north. As the countries to the northward of Corea and Kamschatka, and all along the east side of the continent, are as cold in the winter as it is in similar latitudes in the eastern side of the new continent, and somewhat more so; for the empire of China is much colder than the same latitudes in the United States of America. At the city of Pekin, the cold of their winters *are* [is] greater than *these* [that] of Philadelphia; and so likewise are the heats of their summers greater at Pekin; so that both extremes are greater. In the same parallel the colds and heats are both greater where they may be less influenced by the sea and its temperature, in the interior parts of the old continent. The winters are as cold at Canton, lat. 23 deg. 20 min. as at Charleston, lat. 32, 45."

The parallel between the shape and exposure of the south-eastern coast of China, and that of the United States, is well worthy of notice. And this is the more deserving of attention, as the similitude has been seen and felt by a man who, having repeatedly visited the former, is now an inhabitant of the latter of these countries. We wish for more such *specimens of physical Geography*; and, in addition to the author's remarks on the trade winds, eddies and currents, we have endeavoured to contribute our mite, by stating the facts which show the origin and progress of a north-easterly snow-storm on the Atlantic coast of America. These remarkable phenomena have an intimate connection with, and dependence upon, the principles he has laid down. (See Medical and Philosophical News, title *North-Easterly Snow-Storm.*) The distribution of heat and cold through our atmosphere is but imperfectly understood. By collections of such facts as the au-

thor has presented to us, shall we be enabled eventually to explain, with correctness, the vicissitudes of climate and season, and give a philosophical theory of the winds.

The "Sketches of Medical Topography" bear indication of an observing and attentive mind. They contain the result of observations made in various places. The author has carefully examined many spots which he has visited, with a view to their salubrity or sickliness. And, in general, he shows himself well acquainted with the opinions of philosophy and the discoveries of science. We were, therefore, rather surprised to find him differing from Hippocrates, by affirming that, for the purposes of *drinking* (p. 59) as well as cookery, the wholesomeness of the place makes very little difference with respect to the water. This appears to us to be an oversight; for water of a bad or vitiated quality can scarcely be conceived innoxious. We extract, as examples of Dr. B.'s talent at this kind of delineation, his accounts of several places in Virginia and the Southern States, that our readers there may see and examine them. (p. 69.)

"Sir John Pringle found the health of the army in the Netherlands to be in proportion to the depth of the water under the surface of the earth, which he measured by the depth at which it stood in the wells: but there are many very unhealthy situations, in which there is no stagnant water to be found; we shall mention, as one instance of this, Petersburgh in Virginia. This has always been noted for an unhealthy situation; yet here we could not discover any sufficient cause for this, either in the town or its neighbourhood, if we except only a small piece of banked meadow, of less than two acres, about half a mile from the town, on the river towards Blandford. Along the river side, between it and the town, there is a plain of two or three hundred yards over, which was said to be formerly marshy; but which, when we visited it in the year 1798, was covered two or three feet deep with sand, by an inundation of the river some years before—a very happy circumstance for this town, as it appeared afterwards: for this accident was said to have rendered the place much healthier than formerly. The opposite side of the river to the northward is all high land, and the south side, on which the town stands, rises in different stages, and there is a gradual ascent for about three miles to the south-west; so that the town, although partly elevated from the river, is rather in a valley with respect to the country. The river, or rather the creek of Apomatax, is scarce an hundred yards

over—in some places not as many feet—and at the upper part of the town it is contracted between two rocks scarce ten yards apart. The whole country, in every direction, is elevated and dry, *unless* [except] some very small spaces down the river, along its banks, towards its junction with James's River. But the whole country is high, hilly, and broken, much more so than we could form any idea of, from any description extant.

"Richmond also stands on high, broken ground. On the north side of the falls of James's River it is accounted healthy for the country in which it is. The lower part of this country, about Norfolk, is an uniform plain, intersected with rivers and creeks of tide-water. It is generally covered with pine woods, with some plantations interspersed. The whole country is universally unhealthy; *unless* [except that] on the shores of the sea, the bay and large rivers, it is considerably better than farther inland; but even the rivers are far from being healthy: the open shores of the sea and bay are more so. Hereabout all animal nature appears to decline. Had the Abbè Raynal taken his information relative to America from this part of the country, he would not have been in much of an error. Here the rabbits are not larger than rats, and black cattle do not attain one half the size which is common in other places; and the inhabitants show the visible effects of a pernicious atmosphere, especially after twenty-five years of age. A thin, sallow appearance is more common hereabout than we have ever observed it in any other part of the world, even in the hottest climates; and they are commonly tormented with agues one half the year, and scarcely ever get clear of the appearance of them. In this respect the town is more exempt from sickness than the country; but here they have the infection of the pestilential or yellow fever every two or three years, which, although it spares the natives, and most of those who have resided there two or three years, it is very mortal to all strangers from northern or healthier situations; even those from Petersburgh or Richmond, Williamsburgh or York, commonly suffer here in the autumn. The soil hereabout is uniformly a sterile, loamy clay, with a small mixture of fine sand, and no gravel or stones of an ounce weight within many miles. By this means, whatever rain-water falls on the ground lies until it is evaporated, for there are no declivities, unless on the banks of creeks, to convey it off; and the earth is of a nature too compact to absorb it. By this means it soon becomes impregnated with vegetable matters, and by the intense

heat of the sun, exhalations of a most pernicious nature are extricated; by which the whole atmosphere is adulterated, particularly when the wind is from the south to the south-west; for in this direction it passes over a large extent of such low ground as this described, but particularly the great dismal swamp, which is in some parts only five or six miles distant; and the air which comes in that direction, in warm, sultry weather, such as it very generally brings with it, is by far the most disagreeably suffocating and pernicious that we have ever experienced in any part of the world, even in Sumatra or Java. It appears to many an inexplicable mystery, why the stationary inhabitants of this town are so generally exempt from the infection of the pestilential fever of the fall season, when, at the same time, it rages so violently among strangers; but any one who makes a comparison of these people, and their local situation, with those of other places further north, we are persuaded will find no difficulty in the matter. It is certainly to be explained on the same principles by which it has been found, that the healthy and robust inhabitants of northern countries are more subject to this disease, and generally worse under it, than the inhabitants of warm and unhealthy countries are. In Charleston it has always been remarked, that those who have lately arrived there from the northern States suffer most by this disease when it has raged there: and in the West-Indies it is the armies and fleets, and other lately arrived strangers, who suffer most by it; and in this there is certainly nothing abstruse; but the great source of error arose from confounding the pestilential fever with the common remittents, between which there are very great and obvious differences, both in their nature and appropriate treatment."

It has always appeared to us, that an exact account of the *mineralogical* constitution of the soil was necessary to enable us to comprehend the condition of the incumbent atmosphere. From a knowledge of the strata only, in any given situation or region, can a correct judgment be formed what there is therein or thereon, either to evolve pestilential gases, or to neutralize them. At this period of analysis, we expect a distinct account of every thing lying on the ground, or making a part of it, which can, by solar or other heat, be turned into air or elastic vapour. The author has observed, with great propriety (p. 56), the influence of heat in dissolving substances and suspending them in the air, and the joint aid afforded by putrefaction. If heat thus contributes to turn

substances to vapour, and corrupting animals and plants are the most common of these, how happens it that the intelligent author has written so little of the constitution of the layers of earth, whether argillaceous, silicious, or calcareous? and of the superficial stratum or upper covering of these, formed of the wrecks of organized and but lately animated matter?

(To be continued.)

ART. II. *The Medical Assistant, or Jamaica Practice of Physic; designed chiefly for the Use of Families and Plantations. By* Thomas Dancer, *M. D. late Physician to the Bath, and Island Botanist.* 4to. pp. 384. *Kingston (Jamaica.)* Aikman. 1801.

MEDICINE has been so much indebted to physicians of the West-Indies for many valuable publications, that we perused the work now under examination with uncommon interest. Our eagerness to become better acquainted with the diseases of tropical regions, whose history is comparatively modern and imperfect, arises not only from their importance in relation to the enterprises of agriculture, commerce and war, but also, in a great degree, from the bold and decisive features they assume, by which they are calculated to arrest attention, and to throw light upon the whole circle of medical principles. The labourers in this field need not apprehend that it is too narrow for all the exertions they are able to make. The countries which are incessantly hurrying to the grave such a multitude of sea-faring, trading and military adventurers from other parts of the world, will be interesting objects of consideration to physicians and the public, whether animated by the love of science, the zeal of humanity, or the pursuits of gain.

In the introductory part of this work, which occupies fifty-eight pages, the author undertakes to give a brief sketch of the structure and economy of the human body; an account of the different constitutions of men, arising from temperament, age, sex, climate and habit; a view of the effects of air, exercise, aliment, sleep, repletion, evacuation, &c. and an exhibition of some general pathological and therapeutical principles.

In the next division of the work, which forms the main body of it, and extends to the 322d page, the author treats of fevers as they appear in Jamaica; of bowel complaints; of inflammatory diseases; of hæmorrhages, or discharges of blood;

of catarrhal disorders, consumption, &c. of contagious eruptive disorders; of dropsies, cachexiæ, dirt-eating, &c. of nervous diseases; of cutaneous and ulcerous complaints; of sundry local and anomalous complaints; of the diseases of women and children; of diseases requiring chirurgical treatment, and of casualties.

In an appendix we find a collection of forms or receipts for making up the medicines recommended in the work; a catalogue of such medicines, in their requisite quantities, as are more especially necessary to be kept in families and on plantations; a table of weights, measures, doses of medicines, &c. an account of all the simples of the country whose virtues and uses are known, with the manner of exhibiting them, their doses, &c. an index of diseases, with the simples suited thereto; an alphabetical index of the simples of which an account is given; and a general index to the whole work.

As this work is intended to be chiefly popular, the author has endeavoured to adapt himself, as much as possible, to the capacity of general readers; but, in treating of scientific subjects, it is difficult to lay aside the use of scientific terms. These, therefore, are sometimes unavoidably employed, and are generally explained.

We give the following account of the design and tendency of this publication in the words of Dr. D. extracted from the preface. He judges that it will be found useful, "not only in the hands of those for whom it was primarily intended, viz. those who have families, or who are entrusted with the charge of negroes, and who are frequently at a loss for medical assistance, but in some measure so to medical men; at least to such as are newly arrived in the island, and to those engaged in country practice, who have, in some situations, but little access to books, and less opportunities for reading.

"The author is well aware of the objections it is liable to, from those who think all attempts to render medicine a popular study, nugatory and futile; but he dissents from this opinion. They may not, indeed, be calculated to answer fully the purposes intended, but they are, nevertheless, useful in a great degree, and might, perhaps, be made much more so, were they not decried, and if they were undertaken, not by empirics, but by men of science and ability. Not to mention the necessity of such works for people who *will meddle in physic*, who will take upon themselves the cure of diseases, however ignorant and unqualified; they are certainly requisite for others, who are reluctantly compelled to this office from

circumstances of necessity. Where medical assistance is not at hand, or cannot be afforded, which is not unfrequently the case, something must be done for the relief of pain and the prevention of danger. A suffering mortal is not to be abandoned, or consigned to misery and death, without any attempts being made by those about him, for affording him relief, because they happen not to be medical men, or have not had opportunities of studying physic regularly. Such a knowledge of diseases and their treatment as will enable a man to be, on many occasions, useful to himself and others, may certainly be acquired without a regular and scientific course of study. A book, therefore, like the present one, that may serve as a guide to persons in this situation; that, besides giving general notices concerning health and disease, teaches, in a plain and familiar manner, how to distinguish and treat the prevalent diseases of the climate, it is presumed, cannot but prove useful and acceptable, particularly considering that there is no preceding work of the kind. As to works of a similar nature in Europe, the author has to observe, that whatever may be their respective merits, or however useful they may be found in that part of the world, they are not so well suited to this and other tropical climates, where diseases put on a different aspect and character; where they commonly run a shorter course, and have a more fatal tendency; consequently requiring a treatment very different from that made use of in the same diseases elsewhere."

The following extract of Dr. D.'s account of *Malacia Africanorum*, or the disease of *dirt-eating* among negroes, is presented to our readers:

"The disease of dirt-eating among negroes is precisely the chlorosis or green sickness of women, which Dr. *Cullen*, our best nosologist, thus defines: "Indigestion, or an appetite for substances not eatable; pale colour; œdematous or dropsical swelling; general weakness; palpitation of the heart; obstruction of the menses." The afore-mentioned writer considers chlorosis as peculiar to women, and depending wholly on a retardation or obstruction of the menses; but other authors describe a disease called *Pica* or *Malacia*, in all respects similar, occurring in the male sex, but more particularly among boys.—A late observant traveller (Sonini) affirms, that dirt-eating is peculiar to Africa, and that it affects persons from other countries going to reside there.

"The negroes who eat dirt complain, first of pain in the stomach (whence the French call it the *Mal d'Estomac*,

then breathlessness on the least motion, attended with visible pulsation of the carotids, or the arteries of the neck; they next become bloated; their nails and the palms of their hands become white, and their lips, gums, &c. quite pallid, showing the want of red globules in the blood. These symptoms continuing and increasing, the patient sooner or later dies; sometimes in a very short space of time; at others, through the aid of medicine and nourishment, his fate may be protracted, but he rarely recovers.

"*Treatment.*—The symptoms arising from dirt-eating being exactly the same as in chlorosis, or green sickness, the same remedies have been usually employed, viz. emetics, purgatives, bitters, chalybeates, &c. with a suitable regimen of animal food, &c. which are now and then successful; but when a great number of negroes take to this practice at the same time, the disease is not to be overcome by any remedies yet known. The depriving them of dirt will not obviate the danger, for they appear to suffer as much from the prohibition as from the indulgence.

"In the first place, the strictest inquiry is to be set on foot, to discover the motive that has impelled them to this practice. If they have any reasonable pretext of complaint, their wrongs should be redressed, and their minds conciliated; but neither reparation for supposed injuries, nor any indulgence that can be shown them, will always have the effect of making them desist.

"The disease is characterized by a great degree of torpor. There is the same want of excitement as in jaundice, dropsy, &c. where the liver is affected, and where the stimulus of bile in the first passages is deficient. The dissections in the complaint have been few, and I do not know what grounds there may be for supposing the liver concerned, either in occasioning the disease, or in hindering recovery; but, reasoning from analogy (a loose one perhaps), I have thought that mercurial frictions might be tried, for the purpose of exciting the action of the absorbent system, as in the afore-mentioned complaints, or as a stimulus to the sanguiferous system. Experience, falsifying the notions formerly entertained of the effects of mercury, has shown, that it is a most efficacious remedy in many diseases, where the administration of it, some time ago, would have been thought highly pernicious, if not fatal. The experiment, I think, then, would be a justifiable one."*

* "Since writing the above, I have met with an observation that is quite apposite to this subject. 'Every disease (says Dr. Wade) originating from

We expected to find in this work a more explicit account of the yellow fever, particularly with respect to its origin and causes, as well as the most established mode of treatment. This subject has been much discussed in the island of Jamaica, and we had hoped that the minds of medical men, from the extent of observation and experience existing there, had arrived to a greater uniformity in opinion and practice.

From the diligent and learned research which Dr. D. exhibits in this work, we doubt not it will be considered by the physicians, and by the community in Jamaica, as a judicious and useful addition to the stock of practical publications.

ART. III. *Collections for an Essay towards a Materia Medica of the United States.* By Benjamin Smith Barton, *M. D. &c. Part 1st. The second Edition.* 8vo. pp. 64. *Philadelphia.* Carr. 1801.

OUR readers will remember, that in vol. ii. p. 72, of our work, we gave an account of the first edition of this publication. This second edition is improved by the addition of a number of notes at the bottom of the page. The appendix is also considerably enlarged, by many practical observations, not found in the original work, on the virtues and uses of several important medicinal plants.

The following is the result of the author's recent experience in relation to a plant which has been long known to possess very active qualities.

"*Datura Stramonium.* Since the publication of the first edition of my *Collections*, I have had many opportunities of employing this medicine. I have used it chiefly in the form of an extract, prepared from the fresh leaves. I have principally exhibited it in cases of mania and epilepsy. I cannot

the liver, is cured by mercury and laxatives; so that, in obstinate cases, which have the remotest connection with this organ, mercury ought to be tried.'—*Wade on the Diseases of Seamen in Bengal.*

"Several country practitioners, to whom I have suggested this mode, from the ideas they have formed of its probable success, have determined to make trial of it. In the only case in which I have had the opportunity of making the experiment, it answered the purpose. The patient, who was universally bloated, and proved to be a dirt-eater, after a vomit, and dose of the sacred tincture, had two drachms of mercurial ointment rubbed in daily, till his mouth was affected, which did not happen till he had used four ounces of the strong mercurial ointment; he then took bitters and chalybeates—was allowed good nourishment, and some wine—and, in a few weeks, was relieved of all the symptoms."

hesitate to say that it is a medicine of great and invaluable powers. It is my intention to publish the particulars of the cases in which I have employed this medicine in a separate work. I shall, therefore, content myself, in this place, with observing, that I have found the stramonium especially beneficial in cases of mania attended with little or no fever, or with a cold skin and languid circulation. I have thought it necessary to give the medicine in very large doses. Beginning with a few grains, the dose is gradually increased; and in a few days it may, with safety, be taken to the extent of fifteen or twenty grains. In one case of mania I at length gave it to the extent of sixty grains at a dose. When the patient had continued upon this dose for some time, she broke out into biles upon various parts of the body, and was, at length, discharged from the hospital perfectly cured. In several other cases of mania the datura has been of essential use. Except in one case, I have not perceived any inconvenience from it. In this case, whilst the patient was taking the medicine to the extent of thirty grains, it produced a very enlarged dilatation of the pupil of the left eye, and a palsy of the palpebra of the same eye. But even this was only a temporary inconvenience, which was removed, in a very short time, by the application of a blister. The patient resumed the use of the extract, and was finally discharged from the hospital apparently cured.

"The beneficial effects of the stramonium, in cases of epilepsy, have been likewise very manifest. In a case of epilepsy, accompanied, at various periods, with fever, the medicine seemed to increase the sense of fulness in the head, and other disagreeable symptoms. But, in several other cases, I exhibited it with the most manifest advantage. Although in no case have I been able to effect a cure with the stramonium, I have certainly administered it with the effect of protracting the fits, and of diminishing their violence. Perhaps much more than this cannot be said, with a strict regard to caution, of any other of the many medicines which have been recommended for the cure of epilepsy.

"I have been informed, that in the State of Kentucky the seeds of the stramonium are sometimes exhibited, with advantage, in cases of chronic rheumatism. On this subject I cannot say any thing from my own experience. The seeds of this vegetable are unquestionably endued with very active powers. This is abundantly evident from the pernicious effects which are so frequently observed in children who have

swallowed the seeds. Dr. John Archer, of Maryland, has found them of much advantage in cases of epilepsy. I have used them with seeming benefit, in a case of mania."

We also present the author's observations on the following articles of the class of anthelmintics.

"*Spigelia Marilandica.* In some parts of Carolina, &c. this invaluable plant is known, among other appellations, by the name of snake-root. It is the *unsteetla* of the Cherokee Indians. Every part of the plant is possessed of the anthelmintic property, and accordingly, in Carolina, the physicians employ the whole plant—chiefly in decoction. But the active power unquestionably resides more especially in the roots. It is the opinion of many persons, that the deleterious effects which occasionally occur from using this vegetable do not arise from any pernicious property inherent in the spigelia, but from the root of a distinct plant which is often mixed with the spigelia. I do not think this notion is entitled to any serious attention. The spigelia is, without doubt, a poisonous and narcotic vegetable. It is, in all probability, by virtue of this poisonous quality, that it proves so beneficial in cases of worms. I am acquainted with a very intelligent physician, who, in the exhibition of the spigelia, always deems it necessary, or proper, to persevere in the use of the medicine until it produces some very decided effect upon the brain. I must confess, however, that I have often found it completely efficacious, without observing that it has occasioned the least inconvenience to the system. That it has sometimes done mischief, will not, I believe, be denied. Professor Bergius informs us, that he has known instances of convulsions cured by the spigelia, although no worms were expelled by it. Dr. Garden, speaking of this plant, says, 'It especially answers in continued or remitting low worm-fevers, in which I use its decoction, adding a small proportion of the root of the serpentaria virgin. Its effects in abating the feverish exacerbations are so considerable, that in these I consider it as the most powerful sedative. It is an excellent attenuant.' I have been induced to take notice, in this place, of the observations of Bergius and Garden, because a pretty extensive use of the spigelia has now convinced me that this medicine very often affords relief, and, indeed, effects a cure, in cases in which worms are supposed to be present, but in which none are discharged. If I do not greatly mistake, this will be found an highly useful medicine in some of the febrile diseases of children, unaccompanied by worms, especially in the insidious

remittent, which so frequently lays the foundation of dropsy of the brain."

"*Common Tobacco.* There is a peculiar mode of employing the leaves of the tobacco in cases of worms, which I cannot avoid mentioning in this place, especially as it has, in many instances, produced very happy effects. The leaves are pounded with vinegar, and applied, in the shape of a poultice, to the region of the stomach, or other part of the abdomen. In consequence of this application, worms are often discharged, after powerful anthelmintics have been exhibited internally in vain. We ought not to be surprised at this effect of the tobacco, since we know that the same vegetable, applied externally, is often very efficacious in inducing vomiting. Accordingly, I have, for some years, been in the habit of applying tobacco leaves to the region of the stomach of persons who have swallowed large quantities of opium, and other similar articles, with the view to destroy themselves. It is well known, that in these cases the stomach is often extremely inirritable, insomuch that the most powerful emetics have little effect in rousing that organ into action. Here, as an auxiliary at least, the tobacco, used in the manner I have mentioned, is certainly very useful, and, in many instances, ought not to be neglected."

"*Melia Azedarach.** When I published the first edition of my *Collections*, I had not *any* experience in the use of this vegetable. Since that period, however, I have used it in several cases of worms, and always with advantage. Indeed, I am inclined to think that the character of this new anthelmintic has not been too highly drawn. I will not assert that it ought to be preferred to the spigelia; for I have had much more to do with this than with the melia. The melia is unquestionably a valuable anthelmintic, and ought to be introduced into general practice. I have employed the bark of the root, both in substance, and in the shape of a saturated decoction. In the case of an adult, who took the decoction in large quantities, *with the effect of discharging great numbers of worms*, it seemed to occasion some confusion of the head, and trembling of the hands. These, perhaps, were accidental symptoms; but I am disposed, with the patient, to ascribe them to the medicine. The worm-cases in which I have found the melia useful, were cases of the common round worm, or lumbricus intestinalis. I have not had any opportunity of trying how far it is a remedy against the tænia,

* Pride of India, called in South-Carolina poison-berry-tree and China-tree.

or tape-worm. But I am informed that, in Carolina, it has been used with the effect of discharging great numbers of this species of worm. Should this prove to be the case, the melia will be doubly entitled to our attention as an article of the materia medica. It is not merely in cases of worms that this vegetable has been found useful. Mr. Andrew Michaux, an intrepid French botanist, informed me, that in Persia, where this tree grows spontaneously, the pulp which invests the stone of the fruit is pounded with tallow, and used as an 'antipsoric,' in cases of tinea capitis in children.

"Is the melia a narcotic or poisonous vegetable? Its remarkable effects in destroying and dislodging worms renders this probable, but not certain: for many articles which, with respect to the human body, are entirely innocent, are known to be noxious to intestinal worms, and many other animals. Such is sugar, as has been demonstrated by the experiments of Redi, Carminati, and other writers. The case which I have alluded to renders the deleterious quality of this vegetable very probable. I may add, that in some parts of Carolina the root is deemed poisonous. Horses and horned cattle, however, eat, with impunity, the leaves and berries. Certain species of birds (particularly the turdus migratorius, or robin, and the turdus polyglottos, or mocking-bird) devour the berries in such large quantities, that, after eating of them, they are observed to fall down, and are readily taken. Does not this circumstance render it probable that the berries contain an intoxicating quality? This, however, I believe, is not the general opinion of the inhabitants of Carolina, who ascribe the condition of the birds merely to the circumstance of their having eaten so abundantly of the berries, that they injure entirely by distention. The ripe berries have a sweetish, but nauseous taste.

"As the melia is now completely naturalized to the States of Carolina and Georgia, it may not be amiss to close this article by observing, that the fruit of this vegetable is employed in Japan for furnishing an expressed oil, which grows hard like tallow, and is used for making candles. May not our fellow citizens to the south render it worth their attention to follow the example of the Japanese, in the instance I have mentioned?"

It gives us great pleasure to find that the learned author intends to publish an additional volume relative to other indigenous medicinal productions of the United States, and that he has made such progress as already to be in possession of sufficient materials.

ART. IV. *Notes and Observations on the Pine-Lands of Georgia; showing the Advantages they possess, particularly in the Culture of Cotton, &c. To which is added, a Geographical Sketch of the State of Georgia, with a Comparative View of the Population of* 1791 *and* 1801, *and the Exports of the Years* 1791 *and* 1800. *By* George Sibbald, *of Augusta.* 8vo. pp. 71. *Augusta.* Bunce. 1801.

TO show that the *pine-lands*, called in Georgia *pine-barrens*, are highly proper for the cultivation of cotton, is a favourite object of the author. Their moderate price, the ease of clearing, and the good crop they yield, are substantial recommendations to the emigrant and new settler. Mr. S. is a zealous friend of the cultivation of cotton; he owns himself interested in inviting people to come and embark in it; and he declares that he never misrepresents facts, or departs from the truth. It is another great object with him to promote the consumption of cotton. For this purpose, besides the common articles manufactured from it, he recommends the employment of it in counterpanes, rugs, blankets, carpets, sail-cloth, paper, and small cordage.

The quality of this pine-land "is generally sandy, or a mixture of sand and loam; and wherever you find a clay foundation (which is generally the case), from eight to twenty inches below the surface, those lands are to be preferred, particularly for the culture of cotton." p. 6.

He informs that the pine-lands will produce wheat, sweet potatoes, peaches, apples, cherries, pears, nectarines, plumbs, quinces, strawberries, raspberries, and grapes. He points out the invitation that the country gives to those who are willing to embark in the getting of lumber, and in the preparation of tar, pitch, and turpentine. He extols also the excellence of the soil for grazing, and lays down the advantages which favour the poor and industrious man, who sets himself down with his family in Georgia.

Having proceeded to the 27th page in these statements, Mr. S. in the ensuing eleven pages, gives a plan for an association for the purpose of encouraging the immediate settlement of the pine-lands of Georgia, and to promote the same by emigrations from Europe and the Northern States. This is comprised in seventeen articles. Then follows a geographical sketch of Georgia, which occupies the greater part of the residue of the pamphlet. After giving an account of the lati-

tude, longitude, boundaries, territorial lines, internal divisions and subdivisions of the State, he presents tables of the population, with the districts and counties, and the alterations they have undergone from time to time. The whole population, in 1791, was 82,548 inhabitants; in 1801 it had increased to 162,686. Of these, 53,968 are free white males, 48,293 free white females, 1019 other free persons, and 59,406 slaves.

We offer the following extract as a specimen of Mr. S.'s powers in historical narrative.

"Georgia being a frontier State, and, at the first settlement, only intended as a barrier to protect South-Carolina, a short historical view cannot be uninteresting to those who may be induced to become citizens.

"In the year 1732, the settlement of a new colony between the rivers Savannah and Altamaha was projected in England, for the further security of Carolina, and also to grant relief to poor and indigent families. For this purpose certain persons applied to George the second, and obtained letters patent, bearing date June 9, 1732, for legally carrying into execution what they had projected. They called the new province Georgia, in honour of the king. A corporation, consisting of twenty-one persons, was constituted, by the name of trustees, for settling and establishing the colony of Georgia. The trustees having first set an example themselves, by largely contributing towards the scheme, undertook to solicit benefactions, and to apply the money towards clothing, arming and transporting such poor people as should consent to go over and begin a settlement, and purchasing utensils for them to cultivate the land. They, however, did not confine their views to the subjects of Britain, but generously opened a door for oppressed and indigent protestants from other nations. About the middle of July, 1732, the trustees for Georgia held their first general meeting, and in November following one hundred and sixteen settlers embarked from Gravesend for Georgia, having their passage paid, and being furnished with necessary supplies for building, and for cultivating the soil. James Oglethorpe, Esq. one of the trustees, an active promoter of the settlement, embarked as the head and director of the settlers. They arrived, early in the year 1733, at Charleston, where they met with a friendly reception from the Governor and Council.

"Mr. Oglethorpe, shortly after his arrival, accompanied by William Bull, made a visit to Georgia, and, after examining the country, marked the spot where the city of Savannah now

stands, as the most proper situation upon which to begin their settlement. Here they erected a small fort, and other necessary accommodations. The people were set to work in clearing the ground, and at stated times were exercised in military duty.

"In the mean time the trustees for Georgia had been employed in forming a plan of settlement, and establishing such regulations as they judged most proper to answer the great end of the undertaking.

"In this general plan they considered each inhabitant both a planter and a soldier, who must be provided with arms and ammunition for defence, as well as with tools and plantation utensils for cultivation. As the strength of the province was the chief object, they agreed to establish such tenures of land as were most favourable to a military establishment: accordingly lands were granted upon feudal principles, and could descend only to the heirs male; and, in case the heirs male became extinct, the land reverted to the corporation. No man was permitted to depart the province without license. All forfeitures for non-residence, felonies, &c. went to the trustees for the use of the colony. The use of negroes was absolutely prohibited, and also the importation of rum. None of the colonists were to be permitted to trade with the Indians, unless by a special license for that purpose. These were some of the fundamental regulations established by the trustees of Georgia; and perhaps the imagination of man could scarcely *had* [have] invented a system of rules worse adapted to the circumstances and situation of the poor settlers, and of more pernicious consequence to the future prosperity of the province. Yet although the trustees were greatly mistaken with respect to their plan of settlement, their intentions were truly benevolent.

"Besides the large sums of money which the trustees had expended for the settlement of Georgia, the parliament of England had also granted, during the two last years, £36,000 sterling, towards carrying into execution the humane purposes of the corporation; and after a representation and memorial from the legislature of Carolina reached Britain, the nation considered Georgia to be of great consequence, and began to make more vigorous efforts for its speedy population.

"An hardy, bold race of men, inured to rural labour and fatigue, was highly necessary for enterprises of this kind. To find men of this description, the trustees turned their at-

tention to Germany and the high lands of Scotland, and resolved to send over a number of Scotch and German labourers to their infant province. When the terms were known at Inverness, one hundred and thirty highlanders immediately accepted them, and were carried to Georgia. About the same time one hundred and seventy Germans embarked with James Oglethorpe: so that, in the space of three years, Georgia received above four hundred British subjects, and one hundred and seventy foreigners.

" Afterwards a number of adventurers, both from Scotland and Germany, followed their countrymen, and added further strength to the province.

" However, notwithstanding all that Britain had done for its population and improvement, it still remained in a poor, languishing condition. From the impolitic restrictions of the trustees, these settlers had no prospect during life, but that of hardships and poverty; and, of consequence, at their decease, of bequeathing a number of orphans to the care of Providence.

" At length the trustees, finding that prosperity was not likely to be the result of their regulations, surrendered their charter to the king in 1752, and Georgia was made a royal government. In consequence of which George II. appointed John Reynolds Governor of the province, and a legislature similar to those in other provinces. John Reynolds continued in office for five years, and was succeeded by Henry Ellis, who remained Governor until the year 1760. Under their administrations the province began to flourish, and its population, agriculture and commerce greatly increased. After the year 1763, the wisdom and exertions of Governor Wright gave a new spring to industry, and the province increased with great rapidity."

The attention of Mr. S. is directed to an account of the principal rivers within the settled territory of the State; and Savannah River, Briar Creek, Little River, Broad River and Ogechee, Canuchee, Alatamaha, Appalachee, Ohoopee, Turtle, Great and Little Satilla, and St. Mary's, are particularly noticed.

He afterwards describes the chief towns of Georgia; and Savannah, Augusta, Harrisburgh, Louisville, Federalton, Montpellier, Waynesborough, Warrenton, Georgetown, Sandersville, Sparta, Greenesborough, Washington, Petersburgh, Edenborough, Elberton, Lexington, Carnesville, Clarkesborough,

Columbia, Jacksonburgh, Hardwick, Sunbury, Darien, Brunswick, Frederica, and St. Mary's, are enumerated. The following account is given of the university:

"At a meeting of the Senatus Academicus, at Louisville, on the 15th June, 1801, it was resolved that the State university should be fixed in Jackson county; and a committee, consisting of the Hon. George Walton and Abraham Baldwin, and Generals Twiggs and Stewart, were appointed to fix on the scite. These gentlemen, after viewing every situation which was supposed eligible, fixed on a height near the north fork of the Oconee River, commonly called the Cedar Shoals, which, in point of situation, is excelled by no part of the country. The hill is very high, has a fine commanding view of the surrounding country, and the north fork of the Oconee full in view; has a fine spring of water near the top of the hill, and experience has proved it to be remarkably healthy. The Hon. Mr. Milledge purchased the land for one thousand dollars, and presented it to the university. The committee then marked the spot where the buildings were to be erected, which they named *Athens*. The university is possessed of ample funds, and is under the direction of Josiah Meigs, Esq."

On the natural productions of Georgia, Mr. S. makes the following remarks:

"This State abounds with iron ore, particularly the pine woods. There are also black-lead mines, coal-mines, &c.

"Stone for building is to be found in every part of the upper country. In the neighbourhood of Augusta there are four kinds of free-stone, equal to any in the world. Mill-stones of the same species as the Cologne stones (but said to be of a superior quality), are made in many of the upper counties. Oil-stones, equal to the Turkey stone, are to be had in abundance. Within a few miles of Augusta there is a large bank of white clay or marle, now only used for white-washing. Seven miles from Augusta, red and yellow clay, used as paints, are to be had in abundance.

"The most remarkable curiosities are the ancient fortifications which are to be seen in many parts of the State; and the bank of petrified shells, which commences at Savannah River, 25 miles below Augusta, and runs through Burke, Jefferson, Warren and Washington counties, to the Oconee River. This bank of shells serves for various purposes. They make good lime for building; they make mill-stones superior to French burr; and afford the philosopher a rich variety of the frolics of nature, in petrifactions as various as they are rare.

"The forest trees are in the same variety as in the other States, with the addition of the live-oak. As this tree is daily falling under the axe of the cultivator, it would have been well for the United States to have secured some of the land. We have an exotic which seems, from its form, to have been intended for ship-timber; nothing would induce an opinion to the contrary but its quick growth. This tree is called the *Pride of India*, or vulgarly called China tree. Its form, its foliage and its flower, surpass in beauty all the trees of the forest. It makes handsome furniture, somewhat resembling the wood which is used in Cuba for ship-building, called Spanish cedar, or Spanish mahogany. If these trees would answer the purposes of ship-timber (and I hope the experiment will be made), in ten years growth they would answer for timber for vessels of one hundred to one hundred and twenty tons.

"The pine of this State is of two species: one of them differs from the pine of the northern States; has a *long leaf*, and the wood is much more durable, and is superior for any use except for ships spars, for which purpose it will not answer, being too heavy: the other, called *short leaf*, is only found intermixed with oak and hickory. Those trees, the growth of the *land*, which led to this publication, were the first subjects of oppression by an arbitrary act of the British Parliament, prohibiting the cutting down of *pine trees*, or what they called pitch and tar trees. This was the first act that was complained of by the colonists."

Though we wish the author, who appears to be very open and candid, had been a little more precise and scientific in his *mineralogical* and *botanical* descriptions, yet we are free to acknowledge that we have derived both amusement and information from his work.

ART. V. *Result of Astronomical Observations made in the Interior Parts of North-America.* 4to. pp. 16. *London.* Bucton. 1794.

THIS pamphlet is the result of astronomical observations, made in the northern parts of the western continent, chiefly at the expense of the Governor and Company of Adventurers of England, trading into Hudson's Bay. It was printed by their permission.

It appears that much credit is due to Mr. Philip Turner, who,

while in the service of the company, was enabled, by his skill in astronomical science, to settle many positions with great accuracy, and to assist in laying a permanent foundation for a correct geography of that part of America.

By the labours of Mr. Turner, the latitude of the Canadian settlement on the west branch of the Slave River is 61 deg. 16 min. and 39 sec. N. of Fort Chepawyan, on the Athapescan Lake, 58, 37, 44; of Isle la Crosse, 55, 25, 43; of York Fort, 57, 1, 51; of Albany Fort, 52, 14, 40. He has made many other observations to fix the latitudes of other places.

Herein are noted, likewise, various observations, made by Mr. Mackenzie, by Mr. William Wales, by Capt. Hanwell, by Mr. Peter Fidler, by Mr. David Thomson, Mr. Vandriel, and Capt. Cook, when at Nootka, and the adjacent places.

The curious in geographical and astronomical discoveries will examine these tables with satisfaction and profit, particularly as they have such a desirable tendency to increase our knowledge of that portion of America which lies between Canada and the arctic circle.

ART. VI. *An Oration on the Causes of the Difference, in Point of Frequency and Force, between the Endemic Diseases of the United States of America, and those of the Countries of Europe; delivered, by Appointment, to the Philadelphia Medical Society, on the fifth Day of February,* 1802. *By* Charles Caldwell, *M. D.* 8vo. pp. 46. *Philadelphia.* Bradfords. 1802.

TO compare the diseases of different parts of the world, with respect to frequency, violence and mortality, and to ascertain the result with any degree of accuracy and precision, is an undertaking of great difficulty. In order to accomplish it satisfactorily, the inquirer ought to possess materials and documents which no community have hitherto attempted to collect, and which we can scarcely hope to obtain in the present state of society. But admitting the impossibility of procuring the means to adjust the general proportion of diseases in different countries, until the existing stock of knowledge shall be greatly advanced, it is certainly in our power to form estimates, approximating nearly to the truth, of the comparative prevalence and fatality of particular diseases in the countries thus drawn into comparison. Great advantages

may be expected to arise from this inquiry if judiciously managed. It leads directly to an investigation of the origin and causes of diseases, and renders every observation of this kind more comprehensive, accurate and interesting. The contrast which in this manner is presented to the mind of the inquirer, directs his attention to many objects of importance, which otherwise might escape without notice. And thus nations may equally avail themselves of the sufferings and felicities of other countries, to obtain instruction as to the means of lessening the evils and improving the advantages of their own condition.

Instead of attempting a general comparison of the diseases of Europe and the United States, which is rendered impracticable within the limits of an oration by the extent and complexity of the subject, Dr. C. confines himself to the consideration of *endemic* diseases. From such as may come under this title, he selects *bilious* and *inflammatory*, or, in other words, *summer* and *winter* diseases; including in the denomination of summer diseases, intermittents, common remittents, malignant fevers, cholera and dysentery; and in that of winter, catarrh, peripneumony, rheumatism, &c. He ascribes the greater frequency and force of bilious diseases in the United States to the excess of summer heats—to the excess of humidity —to the abundance of vegetable substances which are suffered to perish and putrefy on the earth—to the excessive consumption of animal food and ardent spirits—and to the impurity of the water used by many. The greater frequency and violence of winter diseases are attributed to great and sudden changes in the sensible qualities of the atmosphere, which are often very remarkable in the United States—to the neglect of wearing flannel under-clothes—and to the extension of that diathesis which is produced by the heat and exhalations of summer into the diseases of winter.

Dr. C. makes the following observations on *cholera infantum*, or what he thinks might not improperly be called *Americana pestilentia infantum*.

"The frequent and melancholy ravages of this disease have rendered a knowledge of it by far too general and familiar among us. I need not, therefore, inform you, that it makes its appearance only in the summer season, that it is a modification of bilious fever, that it prevails chiefly in our cities and low marshy tracts of country, and is confined to children under three years old.

"As far as I have had an opportunity to inform myself,

this disease is peculiar to the continent of America. In no transatlantic author, either ancient or modern, have I been able to find the smallest account of it. Even when the inhabitants of Europe were much more afflicted by bilious diseases than they are at present, the pestilence of children was either unknown to them, or the medical writers of that period have been strangely inattentive in withholding its name from the records of their profession. Neither in the history of the Hungary fever of Evagrius, in that of the endemics of Italy by Lancisi, nor in those of the bilious diseases of Spain, Portugal, and the United Provinces, given by different authors, have we the slightest account of the summer complaint of children.

" Whence, then, is this exemption to the countries of Europe, and why does the disease under consideration rage with such violence in the United States? Are the children of our country possessed of a peculiar and connate irritability of bowels surpassing that of the children of Europe? Or does the bowel complaint, to which the former are so subject, arise from some external agency, which has never shed its influence beyond the Atlantic? Perhaps the following considerations may throw some light on this curious and uninvestigated subject.

" Cholera infantum, or the pestilence of children, appears to originate, in subjects predisposed to it, from the action of two exciting causes.

" 1st. A suspension of cutaneous action, accompanied necessarily by a suppression of perspiration. And,

" 2dly. Excessive and morbid irritation excited in some part of the alimentary canal.

" The first of these causes excites disorder in the stomach and bowels *indirectly*, or by means of sympathy, in the same manner as a coldness, or want of due circulation and action in the feet, is oftentimes productive of dyspepsia and headach. But the latter operates *directly*, in the same way as a caustic or other active stimulant gives rise to excessive action and inflammation, when brought into immediate contact with the skin.

" By far the most extensive and powerful agents in suppressing perspiration are sudden changes in the atmosphere, from heat to cold, and from dryness to moisture. Hence it is well known that the disease under consideration is not only originally excited, but rendered much more obstinate and fatal, by means of such changes. In the summer season it is not

uncommon for hundreds of children, in the city of Philadelphia, to be attacked by this disorder in a very short time after the sudden succession of cold and damp to a previous continuance of hot and dry weather. Such an occurrence has also, in general, a striking effect in heightening the malignity and danger of cases of the disease already in existence. But, in the course of this address, we have had occasion repeatedly to remark, that these atmospheric changes are much more frequent, as well as much greater, in the United States than on the European continent. Their effects, therefore, on the systems of children, already predisposed to bilious fever by the influence of miasma, must necessarily be more extensive and pernicious. I am also informed, and believe my information to be correct, that in Europe young children are more generally defended against the injuries of the weather by flannel under-clothes than in the United States. This neglect to accommodate the dress of infants to the nature of our climate, does mischief beyond calculation, in increasing the frequency and violence of cholera.

"There is reason to believe, that, in the United States, children are more indulged in the use of improper food than in transatlantic countries. I allude particularly to the use of unripe and acid fruit, and other crude vegetable substances. What is more common among us, in the summer season, than to find children of ten or twelve months old devouring cherries, currants, green apples, pears, peaches, cucumbers and radishes? Yet what can be more pernicious in their action on tender and highly irritable stomachs, which require aliment of the most bland and digestible nature? But I have been oftentimes assured, by intelligent and observing travellers, that in the countries of Europe the case is different. There children are denied the use of sour and unripe fruit, and confined to aliment more suited to their condition.

"A humid atmosphere, variable weather, and the use of improper food, operating on systems predisposed to bilious fever by heat and exhalations of summer, appear, then, to be the principal sources of cholera infantum. And to the greater extent and power of these causes in the United States than in the countries of Europe, am I inclined to attribute our exclusive subjection to this formidable disease."

Dr. C. concludes his comparative estimate of the diseases of our country with the following brief recapitulation, which offers very important advice to the community.

"From the foregoing body of facts and reasonings, it ap-

pears that the causes of the frequency and force of the endemic diseases of our country may be divided into general and local, or natural and accidental. The general or natural are, the excess of our summer heats, the frequent, great, and sudden changes in the temperature of our atmosphere, and the flatness and depression of many parts of our country, connected with our copious precipitations of rain. Over these the power of man is capable of exercising but a very limited controul. We can neither impoverish the fountain of the intense heats of summer, elevate to a greater pitch above the level of the ocean the low lands of our middle and southern States, nor lock up the chambers of our northerly winds. In attempting to gain such an ascendency over nature, the philosophy of art would degenerate into folly. Nor are we able to stay the sluices of the heavens, when they are about to pour forth on our country a superabundance of waters.

"But, with regard to our local or accidental sources of disease, the case is different. These we are competent to modify and destroy. We can remove from around our habitations the putrefying recrements of organized bodies; we can clear and cultivate our natural meadow-lands; and enrich our fields by means of manure, instead of more slowly attaining the same end, by suffering them to lie for years in a waste and weedy state. Further, we can erect our dwellings on elevated situations, defend them from the exhalations of mill-ponds and neighbouring marshes by interposing ranges of trees; and, by means of flannel clothing, protect our persons from the changes of the weather. Nor is this all. We can substitute vegetables for part of the animal food which we now consume, malt liquor and cider for our high wines and ardent spirits, and, in other respects, live in conformity to the genius of our climate. These objects fall within the sphere of our power, and it is no less our duty than our interest to attain them. Such an issue would contribute equally to individual health and happiness, and to the prosperity, strength and aggrandizement of our country. Let us, then, like Cadmus of Tyre, wage a war of extermination with these hydras of disease, that our posterity may live in security from their ravages. The voice of patriotism combines with that of nature and of reason, to urge and animate us in the important enterprise."

ART. VII. *Annual Oration, delivered before the Chemical Society of Philadelphia, January* 31, 1801. *By* Felix Pascalis, *M. D. Vice-President of the Society.* 8vo. pp. 48. *Philadelphia.* Bioren. 1802.

THE author of this oration seems to feel much interest in the improvements which chemistry has received within a few years, and to be very sanguine in his estimate of the advantages to be expected from it in extending our knowledge of nature, and in advancing the progress and utility of the arts. We are happy to agree with him in these expectations, and to participate the pleasure which every lover of mankind must enjoy in the contemplation of such a prospect.

Dr. P. gives some brief notices of a few among the numerous and brilliant discoveries which have been made by modern chemistry. He mentions the application of chemical principles and facts to the improvement of particular manufactures, in which the public good is greatly concerned, and especially to the correction of errors in pharmacy, and the promotion of many other important medical inquiries.

Such of our readers as wish a more minute account of this performance will be gratified by a perusal of the oration at large.

ART. VIII. *The Female Monitor, consisting of a Series of Letters to married Women on Nursing and the Management of Children. By the late* Hugh Smith, *M. D. With occasional Notes, and a Compendium of the Diseases of Infants. By Dr.* John Vaughan. 12mo. pp. 224. *Wilmington.* Brynberg. 1801.

THE reputation of Dr. Hugh Smith's Letters, as a popular and instructive work, is so well known to our readers, that we shall not detain them by any unnecessary remarks on that subject. Dr. Vaughan has rendered an acceptable service to the public, by giving a new impression of these Letters, accompanied with notes, which illustrate many passages expressed in a manner not sufficiently clear, correct some errors, and supply occasional deficiencies. In addition to this task, which Dr. V. has judiciously performed, he subjoins a compendium of the diseases of infants, in which the reader will find, reduced within a small compass, many valuable admonitions, conveyed in a perspicuous, familiar and impressive manner.

ART. IX. *Essays Mathematical and Physical; containing new Theories and Illustrations of some very important and difficult Subjects of the Sciences. Never before published.* 8vo. pp. 274. *With a Series of nine new Tables for calculating the Latitude and Longitude at Sea, by Means of double Altitudes and Lunar Distances. New-Haven.* Morse.

BY examining the preface of this work, we find it to be the performance of Mr. J. Mansfield, which was announced in our vol. iii. p. 301. We are very well pleased to find that a mathematical book, written in America, and treating of so many important subjects, has made its appearance. Having got a sight of it but just before this sheet went to the press, we can do little more than notice its title, and inform our readers of the contents.

The essays are on the following subjects: 1. *Use of the Negative Sign in Algebra.* This is offered as an original dissertation, composed with a view of obviating the difficulties which occur in the study of algebra, and the higher branches of the mathematics. 2. *Goniometrical Properties.* The author, in this piece, lays claim to some originality from the manner of discussing the subject, which he hopes will be found more short, clear and easy, than that of other English writers. 3. *Nautical Astronomy.* In this tract, though the first principles are necessarily the same with those contained in all the elementary books on this part of the science, still he believes that the solutions of several problems, the practical method of finding time, with some of the problems on latitude, longitude, and the rules for ascertaining parallax and refraction, are new. 4. *Orbicular Motion.* This essay is given as chiefly original. With a few exceptions, the matter has never before been investigated, and his manner of doing it is in opposition to the modern theory of the tides. 5. *Investigation of the Loci.* 6. *Fluxionary Analysis.* 7. *Theory of Gunnery.* 8. *Theory of the Moon.*

But we cannot do more than thus respectfully mention this work at present.

ART. X. *A Treatise on Dentistry, explaining the Diseases of the Teeth and Gums, with the most effectual Means of Prevention and Remedy; to which is added, Dentition, with Rules to be observed during that interesting Period. By* B. T. Longbothom, *Surgeon-Dentist.* 12mo. pp. 67. *Baltimore.* Prentiss & Cole. 1802.

A DOLLAR was the price which Mr. L. exacted from subscribers for this twelve-penny pamphlet. But this the good-natured purchaser could have excused, if the value of the contents had compensated for the littleness of the book.

In this piece we observe the writer employs "scrophul*ous*" repeatedly (p. 25, 28, 32, &c.) instead of *scrophula;* he confounds the word "sceptic" with *septic* (p. 19, &c); he cautions against giving "stimula*tives*" (p. 26); and writes of tooth-ach from "*cariated*" *bone* (p. 32). In several places he has mentioned "saliv*er*," when we suppose he meant *saliva;* though we must do him the justice to observe that *this* mistake is corrected in his table of errata. He writes "fossips" instead of *forceps* (p. 39). In giving directions for the use of the tooth-brush, he advises (p. 17) that it "be used in a transverse direction, direct up and down;" which seems to be equivalent to employing it just *lengthwise across!* "Any tooth-ach may be mitigated by *a few drops of nitre in spirits!*" (p. 28); and so forth.

After this sample of the surgeon-dentist's performance, our readers will, we have no doubt, excuse us from analysing its pages more minutely. We shall therefore dismiss it, by informing them that Mr. L. after condemning the dentifrices and applications of all other operators in his way, as improper applications, informs his subscribers *very modestly*, on the last leaf, that *his* dentifrice, *antisceptic* lotion, tooth-soap and opiate, stand unrivalled! But we are tired of such trash and imposition.

MEDICAL & PHILOSOPHICAL NEWS.

DOMESTIC.

Correspondence in the Navy Department.

AMERICAN IMPROVEMENT IN THE DISCIPLINE OF SHIPS.

VARIOUS have been the expedients employed to render ships and sea-vessels as healthy as habitations on shore. Many attempts have been made to remove the unwholesome exhalations engendered within them, by VENTILATION. And many machines and projects have been contrived to accomplish that end. The labours of the Rev. Stephen Hales are well remembered for expelling fetid and introducing fresh air. This was a most desirable object.

Numerous also have been the attempts to increase the wholesomeness of vessels, by FUMIGATION. The end proposed by these processes was to destroy the mischievous qualities of putrid and pestilential air, by means of certain vapours circulated through the infected hold, cabin and spaces between the decks. The proposals of Messrs. SMITH and MORVEAUX are among the most recent of the schemes of this kind. It is generally known, they consist in emitting nitrous and muriatic acid vapours through contaminated portions of atmosphere, to correct their vitiated qualities. This is a very imposing but deceitful project.

In the American navy another expedient has been adopted; that is, ALKALIZATION. This is to be effected by means of pearl-ash and barilla, the two alkalies which form the bases of soaps used in house-keeping; and its object is to introduce into ships, which are human dwellings afloat, the same maxims and modes of purification which have been employed with perfect success in the domestic economy of houses or human habitations on shore. This is a noble example set by the directors of American naval affairs to all the maritime governments. It is to be hoped they will soon adopt it on board their ships, both in military and commercial service, and thereby extinguish pestilential vapours.

Letter to the Secretary of the Navy, dated City of Washington, February 3, 1802.

"SIR,

"Pursuant to the request you made, I reduce to writing the project of introducing alkaline salts into the navy of the United States.

"It is estimated that a pound of hard soap will do the washing of ten persons for one week. Such a family would thus consume fifty-two pounds of soap in twelve months.

"Hard soap is a compound of barilla and tallow, slush, or some greasy thing. Frequently the manufacturers blend with the barilla a portion of rosin or turpentine, because these articles are cheaper than animal fats. In all soaps the only *active* material is the barilla. The sole use of the other ingredients is to put it in a *form* convenient for use. But this barilla, too, is the *dearest* article employed in the manufacture of soap. Hence the artists contrive to put as little of it as possible into the composition of their soaps. A great proportion of their profit consists in selling to the consumers grease and rosin at the barilla price. This is one of the mysteries of the trade.

"There is a great inconvenience attending the employment of *soap* at sea. This is the decomposition of it by *salt* water. It being always impossible to employ soap to advantage with water drawn *from the ocean*, and it being often impossible to afford a supply of *fresh* water from the store-casks, soap is of very limited use at sea. Accordingly it has rarely or never entered into a seaman's ration or allowance, in any of the best disciplined navies. Mariners must purchase it from the pursers, or go without it. The latter is commonly the fact. To this source may be traced much of that disgusting nastiness in the persons, clothing, bedding and apartments of seamen, which every person must have observed who has been a voyage to a distant port. And from this nastiness, so accumulated, proceed the poisonous exhalations which so often impair the health and destroy the lives of the crew. The free and seasonable use of barilla can prevent the external source of this mischief among sailors, by the same means that it counteracts, *in daily use*, uncleanness and pestilence in well alkalized and neat habitations on shore.

"It is a curious fact, that, disguised in soap, men are all their lives in the habit of employing barilla, without knowing either its existence or name!

"There are *soft* soaps which are very efficacious in domestic economy. These are fats united to *pot-ash* instead of

barilla. And they are of great strength and efficacy, because they contain a much larger proportion of a stronger alkaline salt. In naval economy they would be highly serviceable, were it not that they, like the former, or hard soaps, are decomposed by *salt* or *ocean* water: of course their use at sea must also be very circumscribed.

"But, comfortably for mankind, it happens that alkaline salts can be employed in *naval* as well as *domestic* economy, without being concealed under the cover of either *hard* or *soft* soaps. They may be employed to great advantage in their native or proper forms. And a few barrels of pearl-ash (which is only a milder form of pot-ash), or of barilla, ought to be put on board as a part of the stores of every well equipped ship.

"Soaps are known to be operative *only* in proportion to the *barilla* or *pot-ash* they contain. In sending barilla or pearl-ash, then, you send those ingredients for which *alone* soaps are useful and valuable; and, by being less bulky, much stowage is saved by the exchange.

"It may be estimated that not more than a third of common soap is alkali; consequently, *three* pounds of soap will not be more efficacious than *one* of barilla or pot-ash, provided due care is taken to avoid waste. Five ounces and one third ought, therefore, to serve ten men for one week; and the supply for one of our forty-four gun ships, carrying 312 men, for a twelve-month, would be somewhere about 858 avoirdupois pounds. This, however, only refers to *personal* cleanliness. When it is considered that a liberal provision of the alkali ought to be made for scrubbing, scouring, and overcoming all manner of uncleanness, both in the ship itself, and every thing the ship contains, the quantity ought doubtless to be about double.

"Nothing can be more plain than the use of it. When mixed with *fresh* water, a very small quantity is to be employed to make a suds, or to impart to the water a slippery feel. This is the ley for washing clothes, and for scrubbing floors, berths, utensils and timbers. When employed with *ocean* water, it will turn of a white or milky colour. But salt water requires more alkali to make a ley than fresh water does. There must be enough added to give it also the lixivial or slippery feel. Clothes may be soaked and washed immediately in this milk-coloured water, without straining it or letting it settle. And ocean water may be alkalized and pre-

pared the more effectually for scrubbing the cabin and whole inside of the ship by the same means.

"Another advantage will result from this practice when adopted. The ships will be the longer preserved from rotting. Nothing contributes so much to the rapid decay of timber, and the rusting of iron and copper, as nastiness. The prevention of this by alkaline salts, then, will have the double effect of preserving the lives of the men, and the durability of the vessel. I only wish the plan to be fairly carried into operation; and, under special instructions from the Secretary of the Navy to some of our intelligent commanders, I have no doubt of its prompt and perfect execution.

"I have the honour to be, &c.

"SAMUEL L. MITCHILL.

"*Hon.* ROBERT SMITH, *Secretary of the Navy.*"

A Section to be added to the Collection of Naval Regulations, issued by command of the President of the United States, on the 25th January, 1802.

RULES FOR PREVENTING THE OFFENSIVENESS AND NOXIOUSNESS OF SEPTIC VAPOURS.

1. When provisions are spoiling, or putrid, they should be brought upon deck, or corrected by pouring on them, in the cask containing them, a ley of pearl-ash, barilla, or of common wood-ashes.

2. When the store-room or hold shall have become foul or sickly from putrid exhalations, it shall be cleansed by washing and scrubbing with similar alkaline ley.

3. Where a berth and its bedding shall have been rendered nasty during sickness, or from unavoidable necessity, they shall be rendered clean by scouring with a mixture of pearl-ash, barilla, or wood-ashes, in water.

4. The clothes of the sick, and all surgeon's bandages and applications, not thrown overboard, shall be soaked, alkalized and cleansed in like manner.

5. Whenever *fresh* water cannot be spared for washing the clothes of the crew, there shall be issued to them a quantity of pearl-ash or barilla sufficient to render *salt* water capable of being washed with.

SPONTANEOUS DECOMPOSITION OF A FABRIC OF SILK.

On the night of March 19th, 1802, during the session of Congress at Washington, Jonathan Dayton, one of the sena-

tors then attending from the State of New-Jersey, sustained a loss of a pair of black silk stockings in an uncommon manner. On undressing himself at bed-time, his stockings were the last of his garments which he took off. The weather being cold, he wore two pair, the inner of wool and the outer of silk. When he stripped off the silk stockings, he let them drop on a woollen carpet lying by the bed-side; and one of his garters, which was of white woollen ferretin, fell down with the stockings. The under-stockings, on being pulled off, were thrown at some distance, near the foot of the bed. He observed, on separating and removing the silk stockings from the woollen ones, that there was an unusual snapping and sparkling of electric matter. But as he had been long acquainted with the appearance, it attracted but transient notice.

He fell asleep, and remained undisturbed until morning, when the servant entered to kindle the fire. The man observed that one of the leather slippers, lying on the carpet, and partly covered by one of the stockings, was very much burnt. Mr. Dayton then rose, and found that the leather over which the stockings had lain was converted to a coal. The stockings were changed to a brown, or what is commonly called a butternut colour. And although, to the eye, the stitches of the legs, and even the threads of their clocks, appeared to be firm and entire, yet, as soon as an attempt was made to touch and handle them, they were found to be wholly destitute of cohesion, their texture and structure being altogether destroyed. Nothing but a remnant of carbonic matter was left, except that a part of the heel of one of the stockings was not decomposed.

Though this destruction of the stockings took place during the night, when nobody saw the manner and circumstances of the process, yet there was evidence enough of the evolution of much caloric while it was going on: for every thing in contact with the stockings was turned to coal or cinder. Beside the slipper before mentioned, the garter was burned. It had fallen partly on the carpet, and partly on and between the stockings. As far as it touched the stockings it was perfectly disorganized and carbonated, and immediately beyond that limit was as sound as ever. The part of the carpet, with its fringe, which lay between the stockings and the floor, was in like manner totally destroyed, just as far as it was covered by the stockings, and no farther. The wooden plank, which was of pitch-pine, was also considerably scorched; and beneath the place where the thickest folds of the stockings had

lain, was converted to charcoal or lamp-black to a considerable depth. In throwing down the stockings when they were pulled off, it happened that about a third part of the length of one of them fell not upon the carpet, but upon the bare floor. This part of the stocking was decomposed like the rest, and the floor very much scorched where it had lain.

There was very little fire on the hearth, and the little there was, was eight or nine feet distant. The candle had been carefully extinguished, and stood on a table in another direction, and about equally distant. Indeed, no application of burning coals or of lighted candles could have produced the effects which have been described. It would seem that the combustion, if it may be so called, proceeded from a surcharge of anticrouon (caloric), or electron (electricity), in the silk, accumulated by means not well understood; and that, not being referable to any known external agent, it may, in the present state of our information, be termed spontaneous.

The substances chiefly consumed were leather, wool, silk, and resinous wood. The linen lining of the slipper was indeed destroyed as far as the leather it touched was destroyed. But where it did not come in contact, it escaped, and the fire showed no disposition to burn even the linen beyond the boundaries prescribed to it on the leather.

What is the theory of this phenomenon? With what other facts is it immediately connected? Whatever men of science may determine on these points, one thing seems to be evident, that if spontaneous combustion can happen thus to bodies so little inflammable as leather, silk and wool, that instances of its occurrence in bodies easier to burn are more frequent than is generally supposed.

RAPID DISORGANIZATION OF THE HUMAN BODY.

A letter to Gen. William Shepherd contained information, that on the night of the 16th day of March, 1802, in one of the towns of the State of Massachusetts, the body of an elderly woman evaporated and disappeared from some internal and unknown cause, in the duration of about one hour and an half. Part of the family had gone to bed, and the rest were abroad. The old woman remained awake to take care of the house. By and by one of the grand-children came home, and discovered the floor near the hearth to be on fire. An alarm was made, a light brought, and means taken to extinguish it. While these things were doing, some singular appearances were observed on the hearth and the contiguous

floor. There was a sort of greasy soot and ashes, with remains of a human body, and an unusual smell in the room. All the clothes were consumed; and the grand-mother was missing. It was at first supposed she had, in attempting to light her pipe of tobacco, fallen into the fire, and been burned to death. But on considering how small the fire was, and that so total a consumption could scarcely have happened if there had been ten times as much, there is more reason to conclude that this is another case of that spontaneous decomposition of the human body, of which there are several instances on record. It is to be regretted the particulars have not been more carefully noted.

On the Part which the Imagination acted in the Experiments at the Bristol Pneumatical Institution, with Nitrous Oxyd.

Our readers remember the accounts given, in the course of our work, of the surprising effects ascribed to a species of air which those who manufactured it called "nitrous oxyd." (See Med. Rep. vol. iii. p. 27, 200, and 207). This production was an *artificial* thing, formed by decomposing or distilling nitrate of ammoniac in a convenient apparatus. And this nitrate of ammoniac too was an *artificial* thing, formed synthetically, by adding nitrous acid to volatile alkali. This kind of gas, therefore, seldom or never is produced in *natural processes*. Though some of the persons who have treated of it have mistakenly confounded it with the noxious air emitted from corrupting substances, it is totally a different production; and experiments made upon "this nitrous oxyd" have no more resemblance to, or connection with, "septic acid gas," than experiments upon the freezing of water have with the variation of the magnetical needle. Yet there has, in this case, been something more unfortunate than the confounding two productions which are very unlike. There has been a degree of credulity exercised in relating the effects wrought by "nitrous oxyd," which is really laughable, and makes the whole subject ridiculous.

The following recital shows, that if the imagination be duly prepared, common air will perform as great wonders as nitrous oxyd. Professor Woodhouse administered (as he writes in his letter to Dr. Mitchill of March 5, 1802) ten gallons of atmospherical air, in doses of from four to six quarts, to several gentlemen who were previously impressed with the idea that they were going to breathe the nitrous oxyd. Quickness of the pulse, dizziness, vertigo, tinnitus

aurium, difficulty of breathing, anxiety about the breast, a sensation similar to that of swinging, faintness, weakness of the knees, and nausea, which lasted from six to eight hours, were the symptoms produced by the common air we breathe, when acting under the influence of the imagination!—But we believe these deceptions imposed upon the world about "nitrous oxyd" are now pretty well understood.

ARROWSMITH'S MAP OF AMERICAN DISCOVERIES IN THE NORTH.

The best map of the new discoveries in the geography of North-America, is the one published in London, 1796, by A. Arrowsmith. This map exhibits an interesting view of the land and water towards the arctic regions of our continent. It is on a large scale, and extends from about 43 to almost 70 deg. N. from Lake Michigan to Repulse Bay. It includes also all the known space from East Greenland and Newfoundland, westward, to Bering's Straits, beyond Alaska and the Fox-Islands, and even to the East Cape of Kamschatka; reaching from about the 40th to the 170th degree of longitude west from Greenwich. The regions lying between James's and Hudson's Bays, and the spine called the *Stony Mountains*, are as particularly delineated as the materials obtained from the Hudson's Bay Company, and other sources, would allow. This ridge runs from N. W. to S. E. and is said to be, in some places, 3520 feet high above the level of their base. All the discoveries of Hearne and Mackenzie are embodied in this map. It contains a view of rivers, lakes, and water-communications, from Lake Erie, N. W. to the Lake of the Woods, up through Lake Winnipeg, the Black Bear, and Buffaloe Lakes, to the "Land's Height;" and beyond that down the streams through the Arathapescow and Slave Lakes to Whale-Island, in the Northern Ocean, at lat. 69 deg. 14 min. At this place the sun does not set on the 11th July, There is not a tree to be seen; and the mountains are covered with snow.

OLMEDILLA'S SOUTH-AMERICAN CHART.

The best map of this vast continent is the *Mapa Geographica del America Meridional, dispuesto y gravado por D. Juan de la Cruz Canoy Olmedilla*, Geographer to the King of Spain, and published in 1775. The original Spanish has been republished in London, by Fader, in 1799, and is declared to be an exact copy of the original, which had become scarce.

Its size is about six feet long by four broad, and it presents a grand and instructive view of the Spanish and Portuguese provinces, and of the great mountains and rivers. It does not embrace the groupes of West-India Islands, but comprises all the region between Curazao, in the latitude of about 12 deg. N. and the extreme point of Terra del Fuego, in the lat. 56 deg. S. It exhibits the country from the eastern points of Paraiba and Ferrambuco, in Brazil, long. 36 deg. W. from Greenwich, to Cape Blanco and Point Santa Helena, on the Gulf of Guayaquil, in Peru, in about 78 deg. The River Amazonas, with its streams Beni and Negro, are vast currents: so are the waters of the Parana, the Urucuay, and the Pilcomayo, which unite their supplies to form the Rio de la Plata. The greatest rivers on the globe run eastwardly from the Andes. Olmedilla's Map includes very little of the country north of the Province of Panama.

Discussion concerning the Employment of the Thermolampe for supplying Light-Houses; between Mr. Gallatin and Dr. Mitchill.

No. I.

The Secretary of the Treasury presents his compliments to Dr. Mitchill, and requests him to favour him with his opinion on Mr. Henfrey's exhibition, and on the proposition made through the channel of the Commissioner of the Revenue, who has the immediate superintendance of light-houses.

The question is, whether there is any thing in Mr. Henfrey's mode of extracting or applying inflammable air, which would justify an experiment, at the expense of government, to ascertain whether the fuel consumed in extracting the quantity of gas necessary to produce a certain light costs less (contingent expenses included) than the quantity of oil necessary to give the same light?

No. II.

Opinion on the Case submitted by the Secretary of the Treasury, concerning the Economy of illuminating Light-Houses according to Mr. Henfrey's Project.

The cheapest and brightest light we are acquainted with among terrestrial bodies, is that which is emitted from *flame* or *blaze*. The material of blaze is inflammable air; and from the singular qualities of a burning body in a gaseous or aëriform state arise the peculiar phenomena which characterterize flame

—a moving, wavering, and pyramidal combustion of inflammable air.

All flame, from whatever material produced, is inflammable air. The basis of inflammable air is a constituent part of all natural and artificial substances which exhibit blaze as they burn. Both *vegetable* and *animal* substances, as they undergo decomposition by fire, are enabled to exhibit flame for no other reason than because a stream of inflammable air rises from and hovers over them, burning as fast as it is disengaged.

The candles in our parlours, whether made of tallow, wax, or spermaceti, emit inflammable air as they burn, and *therefore* burn with *flame*. The same is true of fats and oils, which, whether burned in entries, withdrawing-rooms, streets or beacons, blaze solely because of the inflammable air they emit while undergoing decomposition by fire.

Wood of all sorts burns with blaze, because of the inflammable air which escapes from it. And the flame is great in proportion to the quantity and rapidity of the inflammable gas discharged by the fuel.

The patentee, in the present instance, has merely invented an apparatus for exhibiting the flame at the orifice of a pipe or *tube indefinitely long or remote*, instead of showing it, as is usual, *in the immediate vicinity* of the material affording it. This is all. And so much for the principle of the thing.

Now for the economy of it. Inflammable air is equally the material of flame in all known cases. The simple question is, whether *pine wood*, by the patentee's process, will furnish inflammable air, for the purpose of a light, as cheap and good as *whale oil* in the present mode? Experiments alone can determine this.

I have my doubts, as I told the patentee; first, because the cost of the wood to be enclosed in the iron cylinder, added to the cost of the wood consumed in expelling the inflammable air, may possibly, in some places, amount to more than the price of oil: secondly, I fear that the supply of the inflmmable air will be unsteady, and that, in spite of all his care, the light will sometimes intermit for a longer time than mariners would wish: thirdly, it seems to me that there must be an additional expense to labourers and watchmen to tend the fire and manage the apparatus incessantly.

However, knowing how imperfect human judgment is in all such researches, and of how little avail our reasoning *a priori* is in physicks, I should regret that a public trial should not be made. Moderate and careful encouragement of useful

projects has a liberal and dignified air; and if the Secretary of the Treasury and the Commissioner of the Revenue can, consistently with their public duty, authorise a trial to be made, I should recommend it as worthy the risk. S. L. M.

To the Hon. Albert Gallatin, Secretary of the Treasury.

Capitol (Washington), April 30, 1802.

Account of a North-east Storm, or Memorandum towards a Theory of the Winds in the Region between the Gulf-Stream and the great Range of Mountains.

On the Atlantic coast of America, north-east storms begin in the south-west, and proceed thence to windward, at the rate sometimes of about one hundred miles an hour. It has been remarked long ago by Dr. Franklin, that storms from the north-east, on the eastern side of this continent, begin in the opposite point, or to leeward. Whether this rule universally obtains may perhaps as yet admit of some doubt. But during the uncommonly mild winter of 1801—2, there was a strong confirmation of it.

On the 21st, 22d, and 23d of February, 1802, there was one of the most remarkable and long-continued snow-storms that had been known for twenty years. It raged with extreme violence on the land, and was the cause of several shipwrecks along the sea-coast. Many lives, and much property were lost. The movements in the atmosphere were felt first to the southward, and gradually progressed northward, so as to be sensible there; but not until after some hours.

The facts were collected, by Dr. Mitchill, at Washington, the seat of the National Government, during the session of Congress, when they could be ascertained with the greatest expedition, correctness and care, and are as follow:

After a fine, warm and clear morning, the air, toward evening, grew cloudy, and it became rainy and stormy. The time of its commencement near the capitol, on the banks of the Potomack, as observed by Gen. Smith, was about *half an hour past five* in the afternoon; and before eight the rain was excessive, and the wind boisterous. Here the weather did not become cold enough for snow until towards morning.

The city of New-York, which is situated rather more than 240 miles to the N. E. did not feel this commotion of the atmosphere until about *eleven*. Then the city-watchmen observed that the weather was changed from clear to cloudy, and that snow began to fall; and at twelve, Mrs. Mitchill, who opened a window and looked out, observed that the ground

was already white with snow. The tempest was brewing, and, properly speaking, was formed at two.

That night Mr. Humphrey Wood was on board a sloop bound from Newport (R. I.) to New-York. The tempest drove the vessel ashore, before morning, on Mount-Misery Neck, upon Long-Island. They sailed from Fisher's Island, where they had been waiting for a fair wind, at 10 o'clock at night, with a wind at E. S. E. and warm and pleasant weather. But *by midnight* it hauled E. N. E. and blow a gale, with snow. Fisher's Island may be computed to be about 140 miles E. N. E of New-York.

Mr. Webster observed some of the phenomena of this change of weather, in its beginning, at New-Haven. This place is 89 miles from New-York, or 331 from Washington. Here the weather was clear in the early part of the evening, but was overcast by nine. The stormy commotion of the atmosphere seems to have begun *about twelve.*—At Boston it was rather more than an hour later.

Mr. Blair, an officer who was on board one of three ships from Salem, in Massachusetts, that were lost on Cape-Cod during the storm, related, after his escape, that the weather, on the day of their sailing, Sunday, Feb. 21, was remarkably fine and favourable. At sunset they were about four leagues from Cape-Ann light-house, with a light breeze from S. E. *After midnight* the weather grew very threatening; and at *half past two in the morning* of the 22d the wind veered to the N. E. and it snowed so fast that the ships could hardly discern each other.—The shipwrecks during this storm were numerous and dreadful. Many persons were frozen to death. Salem is distant from Washington 499 miles, or 257 from New-York; so that this latter place is about midway between the two places.

At Portland, in Maine, distant 603 miles from Washington, the snow began between day-light and sun-rise. It was observed by young Mr. Vaughan, who was travelling on the morning of the 22d. At 8 A. M. the wind blew violently.

The storm began still later at Hallowell, on the Kennebeck River. This place is 683 miles from Washington. There the sun rose clear on the morning of the 22d. The air became cloudy in about a quarter of an hour. The snow began about eleven, and the storm had become furious within two hours after. Professor Waterhouse and Benjamin Vaughan, Esq. have particularly attended to these curious meteorological facts.

At Poughkeepsie, 82 miles N. of New-York, and situated beyond the first range of mountains, the storm began about 4 o'clock on the morning of the 22d. And at Albany, 165 miles north of New-York, it did not begin until a little before day-break on the morning of the 22d.

At Providence (R. I.) Dr. Wheaton observed the evening of the 21st to be clear and pleasant. The watchmen informed him "the weather changed before 12 o'clock, and continued cloudy, with variable winds, until the violence of the storm began, which was at half past three on the morning of the 22d."—Providence is 439 miles from Washington.

Accounts from Charleston (S. C.) state that it began there on the 21st, between two and three o'clock in the afternoon. —The distance of Charleston from Washington is 550 miles. —By the newspapers it appears to have been felt in the Bahama Islands.

It will be found, on calculation, that between Charleston and Cape-Ann, along the coast, this stormy movement proceeded to windward at the rate of nearly one hundred miles an hour: for, as it began at Charleston, say at three o'clock, at New-York at eleven, and off Cape-Ann at two the next morning, there is a difference of eight hours between Charleston and New-York, and of three hours between the latter city and Salem, making in the whole eleven hours. Now, computing the distance from Charleston to New-York at about 800 miles, and from New-York to Cape-Ann more than 250, there will be a sea-coast of almost 1100 miles swept over by this storm in somewhat more than eleven hours. But this computation applies only to the sea-coast: for if we take any given point, as the city of New-York for example, and instead of N. E. reckon due N. it will be found that the progress is considerably slower: for it took all the time between eleven at night and day-break next morning to reach Albany, only 165 miles distant in that direction.

Now, these remarks explain some meteorological facts, which, though of common observation, have hitherto seemed paradoxical or unaccountable: for mariners know, that to form a good judgment of wind and weather, they must keep a look-out for clouds and changes of atmosphere *to leeward*. In New-York, the rain or snow which accompanies a N. E. storm can be seen, by labourers along the docks and wharves, in the S. W. at Staten-Island, ten or eleven miles distant, for some time before it begins in the city, so as frequently to break off work, and put away their tools. And it is con-

firmed, by long observation among the farmers in that vicinity, that snow-banks, as they term them, are to be seen in the S. W. many hours before the atmosphere where the observers are is clouded in the smallest degree, or any current of air perceptible. They remark, further, that a judgment can be formed of the weather by noting whether the gathered clouds lowering in the distant horizon are visible to the northward or southward of the setting sun. If at sunset they are to the S. of the sun, they predict a north-east storm, with snow; if to the N. a south-east storm, with sleet or rain.

Observations and Reflections on Storms, and some other Phenomena of the Atmosphere. In a Letter from Professor Waterhouse to Dr. Mitchill, dated Cambridge (Massachusetts), March 20, 1802.

"DEAR SIR,

"Your letter of the 8th instant, requesting information of the precise time the late wide-spreading storm commenced at this place, came to my hands evening before last. I hasten to gratify you as far as I am able.

"Sunday, the 21st of February, the day preceding the storm here, was remarkably calm and pleasant. The smoke ascended from the chimnies in a straight column. The thermometer at noon was 47. Neither hygrometer nor barometer indicated, at that period, any disposition of change in the atmosphere. As late as half past ten at night, the sky was clear and starlight. At about two hours and a half after this, viz. one o'clock in the morning of the 22d, the snow-storm began. My information comes from an intelligent market-man who set out from his own house for Cambridge at midnight. Excepting for a few hours on Wednesday, 24th, we saw not the sun for nine days. It was the longest, if not severest snow-storm I ever knew.

"I here send you an abstract from the *official* meteorological observations* kept in this university by Mr. WEBBER, *Pro-*

* *Some Meteorological Observations.* 1802.

	Barom.	*Therm.*	*Hygr.*	*Wind.*	*The Sky.*
Feb. 21, 9 P. M.	29 80	27	56	N. W. weak.	Few clouds.
22, 7 A. M.	29 60	25	84	N. very strong.	Wholly cloudy.
2 P. M.	29 30	17	83	Do.	Do.
9 P. M.	29 24	12	83	Do.	Do.
23, 7 A. M.	29 61	1	80	N.W. very strong.	Mostly cloudy.

"A severe snow-storm continued through the whole of the 22d. The falling snow was very thick; the wind very strong, and somewhat to the E. of N. but appearing to me, by the college vane, to be nearer to the N. than the N. E. It was noted N.

fessor of Natural Philosophy. You will observe it commences at 9 o'clock in the evening of the 21st. I did not think it necessary to add any thing respecting the magnetic needle.

"I can readily conceive several good purposes may be answered by this inquiry. I have therefore written to *Kennebec* and to *Halifax*, and requested my correspondent at the last place to extend his inquiries to *Newfoundland*. I hope you will extend yours to *Pensacola*, and even to *Jamaica*. The severity of the storm was from north-north-east; that is, north, two points to the east, being, you know, what the ancients termed *aquilo*. These observations will probably strengthen the opinion prevalent in this quarter, that all our severe *north-east* storms begin first, in point of time, in the *south-west*. Franklin was first led to notice this, on being prevented by a stormy sky from observing an eclipse of the moon at Philadelphia, when at Boston, 400 miles north-east of that city, the hemisphere was sufficiently clear for that purpose.

"The ancients had some strange notions of the *local origin* of winds. They speak of them as something different from air in motion, and as if the matter of the winds were a hot vapour or exhalation from caverns in the earth, where *Æolus* kept them in chains, only when his churlish majesty chose to let them loose, like so many bull-dogs, to scare *Juno*, and worry her favourites. This fable, however, is, like almost all those of the ancients, pregnant with wisdom. Lord Bacon himself has laboured to teach mankind how to make *Æolus* subservient to *Juno*, and so did Franklin. The transition from winds to rain and snow is easy and natural.

"It has always impressed me with something bordering on wonder, that, during the *six-and-twenty centuries* wherein the memory and learning of mankind have been exercised, there has not been found one *secretary of nature* sufficiently instructed to give us a complete history of *the ascent of vapours from the ocean, their suspension in the air, the formation of clouds, of snow, and of the descent of rain, with an entire and connected chain of causes.* Des Cartes, Nieuwentyt, Dr. Halley, Hunter, and some few others, have amused the world with their theories on this subject; but which of them is unincumbered with difficulties? What facts we have

"The scale of the barometer is French measure, but is here reduced to the English or common scale, and correction made for the effect of variation in temperature. The instruments are placed without a north chamber window."

in this sublime part of nature are mere fragments widely scattered. The phenomena in these lofty regions of the air have been rather terrific objects to purblind superstition, than instructive appearances to calm philosophy.

"The never-ceasing circulation of water between the ocean and the dry ground has been contemplated, from the earliest ages, with grateful admiration; but not being an object of sight, has been ranked among the inexplicable works of Deity. The clouds dispensing refreshing showers of rain on the dry and thirsty ground; the flow of rivers, with their long train of beneficial consequences, could hardly escape the notice of any thinking being in every age of the world. We accordingly find the supply of water frequently mentioned in the OLDEST BOOK we have, among the most wonderful, as well as valuable of Heaven's blessings.

" Seeing the earth annually covered with a rich and beautiful carpet of vegetables, and these astonishingly variegated, and gradually developing '*from seed time to harvest time*,' must have led those of ancient days to recognize the proximate causes, the warmth of the sun, and the moisture from the clouds; and these again to an acquaintance with that perpetual circulation subsisting between the ocean and the mountains, through the instrumentality of the atmosphere, and by the medium of rivers to the ocean again. But the philosophy or explanation of this vivifying phenomenon is spoken of as inscrutable and past finding out. They did then, as we do now, carry our investigations as high as we can, as in the case of *gravitation*, and beyond that principle say, with them, '*it is the hand of God;*' an expression denoting the last term of our analytical results. Unable to investigate the essence of *light* and of *fire*, the Deity was called by the name of these inexplicable agents.

" In those early days, when the knowledge of nature was confined to narrow limits, they, like our Indians,

> ' Saw God in clouds, and heard him in the winds.'

Hence they stiled the Deity 'the *father* of the rain,' and represented him as '*calling forth the waters of the sea, and pouring them down according to the* vapour *thereof*.' Whence we infer, they believed the water rose in the form of *vapour* from the ocean, and that it became *freshened* in its passage through the air; and it moreover appears that they were sensible that this process was regularly and perpetually performing; for they remarked that '*although all the rivers run into the*

sea, yet was the sea not full; unto the place whence the rivers come, thither they return again.' They seem also to have known that MOUNTAINS made a part of this GRAND APPARATUS, and to have believed that it was not a fortuitous or random process, but regulated, as we now find it, by weight and measure. May not this be inferred from that sublime question of Isaiah—'*Who hath measured the* waters *in the hollow of his hand, and weighed the* mountains *in scales?*'

"Although they discerned this magnificent apparatus, and saw its effects, yet were they restrained by a religious awe from attempting its investigation, because *storms*, *lightning* and *hail*, were conceived to be the precursors of the chariot of the Deity! '*who maketh the* clouds *his chariot*'—'*who walketh on the wings of the* wind'—accompanied with '*hail-stones and fire!*' Or, if you choose to have the spirit of these passages expressed in English metre—

> 'On cherubs, and on cherubims,
> 'Full royally he rode,
> 'And on the wings of all the winds
> 'Came flying all abroad.'

For this reason, probably, the origin and course of the winds, '*whence they come and whither they go*,' were deemed mysterious. Hence, instead of investigating the cause, their pious minds, overwhelmed with awe, sunk into undiscerning amazement! Under such impressions, I cease to wonder that he who wrote that ancient drama, the book of *Job*, puts among the most difficult of his questions that which demands an explanation of the '*balancing of the clouds.*' But shall not we, who are happily free from the terrors of the Mosaic, as well as Pagan systems, and who enjoy the encouraging *intellectual* scheme of Christianity, which, never forgetting Deity, postpones every thing *corporeal* to the *primary mental cause**—I say, shall not we unite our efforts to fill up that dreary blank left in science by the ancients? And 'as man, who is the servant and interpreter of nature, can act and understand no farther than he has, either in operation or in contemplation, observed of the method and order of nature,† let us commence a patient observation of the ordinary and extraordinary phenomena that occur in this scene of wonders, the atmosphere; and then collect those fragments of knowledge, widely scattered through the world, on the same subject.

* Harris.
† Novum Organ. Scient.

" Although much of the operations going forward in the atmosphere may have some links that have hitherto escaped the most inquisitive eye, and others, though seen, may not be fully understood, still we ought not to be discouraged. These detached links will one day be united, and form a part of the great chain of natural causes, adding still stronger proofs of that *unity of design* which pervades the great Temple of Nature.

" Some men seem destined to observe and record naked facts; others, of a superior genius, follow after and apply them. Some future Franklin may do with these *desiderated* facts what Newton did with those collected by Kepler and Galileo, and therewith form a system which may teach us to bridle the *winds* themselves, and render them farther subservient to human uses."

Pot-Ash turning to Salt-Petre (or becoming saturated with Septic Acid) on the Surface of dead Flesh.

The people of Virginia are famous for the great quantity and excellent quality of their bacon. On killing their hogs in autumn, a large proportion of the meat is cut up into hams, shoulders, midlings, and flitches of bacon, and very little is salted down into what is called pickled pork.

In the course of experiments upon the art of curing and preserving their hams, they have fallen upon a method which is preferable to the sprinkling them with salt-petre. This is to rub them with a quantity of nice hickory ashes (which are always strongly charged with caustic pot-ash) instead thereof. This alkali is rubbed on at the time the muriate of soda, or common salt, is applied. The effect of it is excellent. The gammons are kept in better order than when salt-petre is employed, and their flavour and juices are more exquisite. But what is more remarkable, is the fine ruddy colour which the hams gradually acquire, equalling those which have been perfectly salt-petred, and looking exactly like them. Many of the planters and other house-keepers are so entirely convinced of the superior economy and excellence of this form of caustic pot-ash, that they would not use salt-petre if it could be got upon the easiest and cheapest terms.

Now, these remarkable facts seem to admit of an obvious and luminous interpretation, corresponding exactly with a multitude of other phenomena. In common salting of meat, the septic acid of the meat unites with the soda of the salt into a septite of soda, while the muriatic acid combines with the ani-

mal substance into a muriate of meat. If pot-ash is added, the septic acid will be attracted by it, and turned to a septite of pot-ash, or salt-petre. The hams are less vitiated and tainted than they otherwise would be: for, by employing pot-ash, the nasty and *noxious septic acid is neutralized, and a salt-petre formed on the spot;* and, when *formed on the surface of a gammon,* reddens it, and makes it tender as effectually as if *it had been imported from India:* Therefore caustic pot-ash is better for preserving flesh than septite of pot-ash; because the one can absorb septic acid—the other is saturated already.

Project for relieving Disorders of the Human Constitution by diminishing the Pressure of the Atmosphere upon it.

A machine has been lately invented in England for removing the weight of the atmosphere from the leg or arm. It is affirmed that, by this operation, a powerful effect is wrought upon the whole frame; and that gout, rheumatism, and other painful diseases, have been relieved and cured by it. The beneficial operation of the machine is said to be aided by admitting watery steam or other vapours into the partially exhausted recipient where the limb lies.

The apparatus consists of a copper vessel or receiver, circular and oblong, with a cavity large enough to contain the fumigation, and with an opening sufficient to admit the upper or lower extremity. The orifice through which the limb is introduced is supplied all around with ox-bladder; and, by means of a running string, it is connected with the limb, and rendered air-tight. This being done, an air-pump, which is a part of the apparatus, and joined with the receiver containing the limb by a metallic tube, is set to work, and as much air drawn out as the operator deems to be sufficient. And afterwards, when he judges it to be proper, he admits into the chamber or receiver where the limb lies a quantity of steam or vapour from a heated vessel, graduated by a thermometer, which are parts of the machinery. And this kind of *vapour-bath* is suffered to act upon the parts as long as it seems necessary.

This is a vapour-bath, and it is believed to be a most excellent one: for it would not seem that there was any thing considerable done in the way of exhaustion, when there was nothing to resist the pressure of the incumbent atmosphere but an ox-bladder. And though it should be conceded that there was as much exhaustion made as the living body could bear,

yet the equilibrium would be instantly restored on the admission of the vapour.

It would be a curious process to try what would be the effect of a diminished atmosphere upon the human constitution in certain diseases; and it would be agreeable to have correct accounts of some well-devised experiments to that effect.

THERMOLAMP.

This is an apparatus for separating the phlogiston (hydrogen) of wood, or other inflammable bodies, from their carbon, and less volatile ingredients, and burning it by itself.

In ordinary combustion, the carbon exhibits to the eye the appearance of a *solid* and red-hot substance, while the phlogiston evaporates, and manifests itself in the form of a *fluid* and ignited matter. The former of these is termed *live-coals*, and the latter *flame* or *blaze*. Common *flame* is seen in the neighbourhood of live-coals, and wavering and hovering over their surface. These appearances, however, are only observable when fuel containing carbon and phlogiston is burned IN THE OPEN AIR, or exposed to ATMOSPHERICAL INFLUENCE.

The modern theory of these processes is, that a portion of the gaseous oxyd of light (phosoxygen, or oxygenous air, as it is called) is decomposed on the surface of the fuel; and while the oxygen combines with a portion of the carbon, and flies off in the form of carbonic acid gas, the heat and light are disengaged, and become sensible to the touch and sight on the surface of the remaining carbon: then the phlogiston begins to be set loose from its connection as a constituent part of the fuel, and, combining with a portion of the anticrouon (caloric), turns to inflammable air; but no sooner has this inflammable air acquired the due degree of heat, than it combines with another portion of the atmospheric oxyd of light, and turns to water or aqueous vapour. The two fluids, or their bases, thus converted to water, give out the heat and light which are discoverable in blaze. This is the explanation of the common process of combustion and inflammation.

Now, this being understood, the theory of the THERMOLAMP will be easily comprehended. It merely consists of exposing wood, or any other kind of fuel, or, in short, any thing that contains carbon and phlogiston, to a high heat, in a CLOSE APPARATUS, instead of doing it in the open air. The consequence of such heating is plainly this; Atmospherical air being excluded, and no oxygenous gas or oxyd of

light being present, it is impossible, in this close machine, that either the carbon can turn to fixed air, or the phlogiston to water. But the former will remain in the bottom of the apparatus, in the shape of *tar*, *charcoal*, or *lamp-black*, while the latter will be driven off under the guise of *inflammable air*, more or less carbonated. And this may be conducted through pipes and tubes to any distance, and let out through as many holes or apertures as the operator pleases.

It is known that *mere* inflammable air cannot burn: to exhibit flame it must come in contact with the gaseous oxyd of light: consequently it is impossible that it should inflame until it is discharged from the close machine in which it was produced. Instantly on its liberation it may be set on fire, and will continue to burn with a beautiful flame as long as the fire below is kept up, or the included materials can furnish it.

Mr. Henfrey, of Baltimore, has obtained a patent for the discovery of the art of applying phlogistic gas, so evolved and so conducted, to the lighting of theatres, cities, light-houses, private rooms, &c. by means of hollow pipes leading to tapers, candlesticks and chandeliers, through which that peculiar material of blaze is made to pass. The exhibition is very beautiful and brilliant.—*See the correspondence with the Secretary of the Treasury, p.* 463.

DE VAUX ON THE DEMEPHITIZING QUALITY OF LIME.

In France an attempt has been made, at last, to introduce *lime* into infected houses as a cleanser and destroyer of what they call "mephitism," or what we denominate septic acid gas, and the nasty vapours which commonly accompany it. M. CADET DE VAUX has addressed a letter to the Minister of the Interior on the subject, and extols in high strains the "demephitizing" quality of this alkaline earth. He says Messrs. Fourcroy and Deyeux have approved his experiments and theory, and that, supported by their authority, he can boldly recommend his white-washing to destroy and prevent the mephitization of walls, &c. He puts on his lime with a mixture of milk and oil to make it stick. In America this has been matter of experimental conviction and practical utility for years. The introduction of this *weak* alkali will probably soon lead to the employment of the *stronger ones*. And when all these *powers of health and cleanliness* are properly introduced, the administrators of hospitals, prisons, ships, and private dwellings, may safely dispense with "oxygenated muriatic acid gas!!"

Cases of Pulmonary Consumption cured by a Salivation: Communicated in a Letter from Dr. Rush to Dr. Miller, dated Philadelphia, May 6, 1802.

"I have great pleasure in informing you that Dr. Parke has lately discharged a patient from the Pennsylvania Hospital, perfectly cured of a pulmonary consumption, by means of a salivation. I have likewise been again made happy in seeing the triumph of that remedy in the case of Mr. James Hunter, a young gentleman of respectable character in this city. He had been afflicted for several years with weak lungs; and, in consequence of an attack of the bilious fever last fall, became diseased with all the usual symptoms of a confirmed consumption. The salivation was advised by Dr. Physick and myself, and was continued to a severe degree for several weeks. His cough and fever left him with the cessation of the discharge from his salivary glands. I saw him on the second of this month in good health, and with a considerable increase of flesh since his recovery."

An Account of a Prize-Dissertation: Communicated in the same Letter.

"I have just seen a letter from London, in which I have observed, with great pleasure, that Mr. Alfred Thurston, of Winchester, Virginia, has received a prize from the Medical Society of Guy's Hospital for the best dissertation on the yellow fever. In this dissertation the author maintains its domestic origin, and denies its ever becoming epidemic by contagion."

PREMIUM OF THE PHILADELPHIA MEDICAL SOCIETY.

At a stated meeting of the Philadelphia Medical Society, held on Saturday, 20th February, 1802, it was resolved that a premium of one hundred dollars, or a gold medal of that value, be offered for the best Natural and Medical history of any one of the United States of America.

The candidate is requested particularly to attend to the nature of the soil commonly prevalent in any part of the country he may describe; to the effects produced by clearing the land on the climate; and the consequent influence of these causes on diseases; to the state of longevity in the inhabitants; to the flowering of certain herbs and trees as connected with agricultural operations; and, lastly, to the mineral and saline productions of the earth. He will be much aided in his inquiries by attending to the hints and subjects of ob-

servation contained in Count Berchtold's Essay to direct and extend the Inquiries of Patriotic Travellers, and in Dr. Lettsom's Naturalist's and Traveller's Companion.

To each dissertation a motto must be prefixed, and the same motto must be put on the back of a sealed letter containing the name of the author. All dissertations except that to which the prize shall be adjudged, will be returned to any person that may be directed, together with the letter which contains the author's name, unopened. The dissertations must be delivered free of expense, to the President, on or before the last Saturday in February, 1804.

BENJAMIN RUSH, *President.*
HEDGE THOMPSON, *Sec. Pro. Tem.*

ALKALIES BENEFICIAL IN THE MEASLES.

Extract of a Letter from Dr. E. Banks, of North-Yarmouth, to Dr. Jeremiah Barker, of Falmouth (Maine), dated April 21, 1802.

"I have had a great deal of business in the practice of physic since I was at your house last fall, and have had an opportunity of trying the effects of the alkaline plan in a great variety of cases. All I have time to say about alkalies, at present, is, that in almost every instance in which I have used them, they have essentially afforded relief, particularly in the measles, when they have been violent, in which they seem to have operated like a charm. I am determined, for the future, to make a very liberal use of them; for to neutralize *acids* with *alkalies* is as frequently necessary, in my humble opinion, as it is to counteract *debility* by *stimulants*."

VACCINE DISEASE.

Dr. Elisha North, of Goshen, in the State of Connecticut, who has distinguished himself by his exertions in extending the benefits of the new inoculation, is now engaged in endeavours to settle some of the contested questions on that subject. Dr. Jenner, and some others, had supposed virulent matter, accidentally conveyed from the heels of horses, affected with grease, to the udder and teats of cows, to be the cause of the vaccine pock. From facts which have lately fallen under the notice of Dr. North, he is inclined to believe that this opinion was adopted without sufficient ground; and he is confirmed in this conclusion by the result of some careful inquiries on this subject, made by Dr. Trowbridge, of Danbury.

MEDICAL COMMENCEMENT.

At a medical commencement, held on the 4th of May, 1802, in Columbia College, in the city of New-York, Joseph Bayley and Jacob V. Brower, A. M. were admitted to the degree of Doctor of Physic. The inaugural dissertation of the former is "on the origin and propagation of the yellow fever;" that of the latter, "on the use of digitalis purpurea, or purple fox-glove, in the cure of diseases."

WATER-PROOF CLOTH.

To discover a process for rendering cloth water-proof, without, at the same time, filling its pores in such a manner as to prevent perspiration, has long been a desideratum. It gives us pleasure to announce a discovery which promises so many advantages, in point of health and comfort, to all ranks in the community. The patentees, Ackermann, Suardy & Co. have also applied their process to render paper water-proof as well as cloth. We have seen specimens of both in America. This invention promises to be of great service to valetudinarians, to seamen, soldiers, and travellers, by enabling them, more effectually than heretofore, to protect themselves against wet, and the consequent cold.

FOREIGN.

GALVANISM.

FOURCROY, Vauquelin, and Thenard, being engaged in making galvanic experiments, have been rewarded by the discovery of one of the most important and remarkable facts relating to that phenomenon. Though it is known that, by multiplying the plates of Volta's column, the force of the strokes, as well as the quickness of the decomposition of water, is considerably increased, yet it remained to be examined, what effect might be produced by increasing the surface of the plate. To this end the above chemists constructed a column of plates, the surface of each of which was one square foot: the strokes, as well as the decomposition of water, were the same as from an equal number of smaller plates, but the combustion of metallic wires proceeded immediately with great violence, particularly in oxygen gas, which phenomenon was not produced by a number of smaller plates.

[*Lond. Month. Mag.*

FURTHER ACCOUNT OF GALVANISM.

The celebrated philosopher, Van Marum, of Holland, and Professor Pfaff, of Kiel, have undertaken a large course of experiments to illustrate the nature of galvanism. They have charged electrical batteries of 140 feet square, by a single contact with the pile of Volta; and they have evidently proved, that this pile is a true excitatory apparatus of electricity, which surpasses, in some respects, the strongest electrical machines. They have melted, by the electricity of this apparatus, to the amount of twelve inches of iron wire, and even of wire of platina. [*Ibid.*

THERMOLAMP.

It is known that wood, on being burnt, yields one-sixth of its weight of coal and five-sixths of smoke, containing a considerable proportion of inflammable air, which is commonly wasted without use. For employing it to the purpose of heating and illuminating the room at the same time, an apparatus has been discovered by Citizen LEBON, engineer of bridges and roads, which he calls *thermolamp*, consisting of a box or vessel, in which the double advantage of heating and illuminating is united. The smoke rising out of it, freed from all vapours and soot, may be conducted through the smallest tubes, which may easily be concealed in the plaster of the walls or ceiling. They may be made of oiled silk, but the orifice must consist of metal, to prevent the burning of the silk when the air takes fire at the contact with the atmospherical air. By this apparatus chimneys become quite needless, as the flame may be conducted in a moment from one apartment to another, without leaving either soot, ashes or coals. The fire thus produced wants no particular care to be kept up, and has, besides, the advantage, that its pure light may be formed into flowers, festoons, &c. or it may be made to emit its light from above in the purest brightness. The author of this curious discovery, who announced it to the National Institute in the year seven, is preparing for publication a full account of its nature and composition. [*Ibid.*

FURTHER ACCOUNT OF THE THERMOLAMP.

A new invention has lately attracted the attention of the Parisian economists. It is called the *thermolamp*. With the smoke of five or six logs of wood, very new, from ten to twelve pounds each, carefully collected, and reduced to the state of gas or inflammable air, the inventor, Citizen Lebon,

an engineer, was able, for 24 hours, to spread, throughout seven large apartments, the mildest heat and the most vivid light, and, at the same time, to enlighten a large garden in such a manner as to make it appear like noon-day. The flame can be shown detached from all support, and can be modelled to any shape. When enclosed in a crystal globe, the flame by no means soils it. [*Gazette de France.*

NEW REMEDY PROPOSED FOR PULMONARY CONSUMPTION.

Dr. Hildebrand, Professor of Medicine at Lemberg, has been trying sugar of lead as a remedy in pulmonic consumption. Of seventeen patients whom he had under his care, he states that four were completely cured: but in the others the suppuration of the lungs had already proceeded too far, as appeared on opening them after their death. The sugar of lead is given, according to circumstances, mixed with opium. [*Ibid.*

MEANS OF PRODUCING INTENSE HEAT.

A discovery has been lately made by Messrs. Lancliffe and W. Hawkes, jun. of Newcastle-upon-Tynne, which promises not only gratification to the curious, but considerable utility to chemical science. The discovery consists in the combustion of the oxygen and hydrogen gases, by means of a blow-pipe. The gases are conducted in due proportions, by tubes, from their respective reservoirs, and made to terminate in concentric circles, where a flame the most rapid takes place, causing a heat of such intenseness, as, till now, has baffled the efforts of chemistry to produce. [*Ibid.*

COMBUSTION OF SMOKE.

The construction of furnaces capable of consuming their own smoke has long employed the attention of able artists, but all their endeavours had been frustrated, either by the troublesome complication of apparatus, or the imperfect attainment of the object proposed. This great desideratum is, however, at length supplied by an invention of Messrs. Robertsons, of Glasgow, which, for simplicity and efficacy, is truly admirable. The opening into the furnace, instead of being closed by a door, consists of a four-sided funnel or hopper, which is kept filled with coals, and, in proportion as the fuel is consumed in the furnaces, a fresh supply is constantly decending the hopper. Thus the first combustion, or

that which disengages the principal part of the smoke and flame, takes place near the mouth of the furnace, and a considerable proportion of the smoke, without any other contrivance, would be consumed by passing over the red-hot fuel in the further part of the furnace: as, however, the complete combustion of the smoke cannot take place without a further mixture of atmospheric air, this is provided for by the introduction of a cast-iron plate about three quarters of an inch above the top of the hopper, between which is thus formed a slit of the above-mentioned depth, and equal in breadth to the front of the furnace, through which a constant current of air descends, and mixes with the smoke. This aperture may be enlarged or diminished, by elevating or depressing the iron plate, by means of a pin; and, by adapting the supply of air to the quantity of smoke produced, the whole is completely burned before it has time to enter the chimney.

[*Lond. Month. Mag.*

EFFICACY OF GINGER IN THE GOUT.

It has lately been ascertained, and is confirmed by the personal experience of Sir Joseph Banks, that the powder of ginger is an effectual palliative of the gout. Sir Joseph takes two tea-spoons heaped up with ginger-powder in a pint of milk, boiled with bread and sweetened with sugar, regularly for his breakfast; and, in consequence, the fits of gout, which used to attack his head, loins, and stomach, are now confined entirely to his extremities, and are of much shorter duration. The ginger should be taken at first in smaller quantities, according to the strength of the stomach. [*Ibid.*

GERMINATION.

E. A. Lefebure, assistant chemist in the School of Health at Strasburgh, has lately made some curious experiments on germination. As he employed in his experiments only rape-seed, they cannot be considered as sufficiently varied to admit of general conclusions; but as they may furnish hints to others who may be disposed to give them greater latitude, we shall briefly state the most striking results.

Lefebure first observes that taking away the cotyledons or seed-leaves retards and weakens vegetation, but by no means impedes the germination, if the upper part of the fibre, to which the cotyledons are attached, be not removed. M. Lefebure contradicts Böhmer, who says that imbibing the moisture of the earth is performed merely by the umbilical

fibre; whereas Lefebure found, by experiments, that this function is discharged by the whole surface of the seed. The earth is merely the recipient of the matter requisite for the germination of seeds. The conditions of tenderness, moisture, warmth, and darkness of colour in the recipient, are considered as necessary to the germination of the seeds deposited in it. M. Lefebure, after the example of Bonnet, made choice of other substances for recipients, and found that the seeds germinated in several of them; but not in the oxyd of mercury, alkohol, ammonia, camphor and salt-petre; nay, oxyd of mercury, cantharides and salts, destroyed vitality and the property of germinating. Many of these matters, and particularly salts, seem to impede germination, chiefly by their requiring too much water for their solution, and by these means depriving the seeds of it; for this reason cream of tartar impeded germination the least, because it deprived the seeds the least of water. Ashes also impeded germination as long as they contained soluble salts, but as soon as they were oxydated they promoted that process. M. Lefebure examined also the different depths of the earth at which seeds germinate, the necessity of drawing the carbon from the earth, and of the access of atmospheric air. Though many cases are known in which seeds have germinated without the access of air, shut up in animal bodies or in potatoes, the matter of light, however, was not excluded.

Of the different kinds of gas of which the atmosphere consists, germination requires oxygen alone. Carbonic acid, hydrogen, and azote, on the other hand, impeded germination without destroying vitality. Seeds grew in atmospheric air, however, mixed with different substances, provided it contained oxygen. The air in which seeds had germinated, M. Lefebure found to be surcharged with carbonic acid.

He examined also, in a more accurate manner, the influence of water on germination, and found that the more foreign matter water is impregnated with, the more unfit it is for the purpose of germination. [*Philos. Mag.*

APPENDIX.

ARTICLE I.

INSTRUCTIONS FOR VACCINE INOCULATION.

LET the vaccine fluid be taken, for the purpose of inoculation, from a pustule that is making its progress regularly, and which possesses the true vaccine character, on any day from the fifth to the eighth, or even a day or two later, provided the efflorescence be not then formed around it. When the efflorescence is formed, it is always most prudent to desist from taking any more of the virus from that pustule.

To obtain the virus, let the edges of the pustule be gently punctured with a lancet in several points. It will gradually ooze out, and should be inserted upon the arm, about midway between the shoulder and the elbow, either by means of a very slight scratch, not exceeding the eighth part of an inch, or a very small oblique puncture.

A little red spot will appear on the punctured part on the third day, if the operation succeed, which, on the fourth or fifth, becomes perceptibly vesicated. It goes on increasing till the tenth day, when it is generally surrounded by a rose coloured efflorescence, which remains nearly stationary for a day or two. The efflorescence then fades away, and the pustule is gradually converted into a hard glossy scab, of a dark mahogany colour. These progressive stages of the pustule are commonly completed in sixteen or seventeen days.

A single pustule is sufficient to secure the constitution from the small-pox, but as we are not always certain the puncture may take effect, it will be prudent to inoculate in both arms, or to make two punctures in the same arm, about an inch and an half asunder, except in very early infancy, when there is a great susceptibility of local irritation.

If the efflorescence surrounding the pustule should be extensive, and occasion much local heat upon the arm, it may be cooled by the repeated application of pieces of folded linen dipped in cold water, or still more expeditiously by a strong solution of the *aqua lythargyri acetati** in water, an ounce, for example, of the former in five or six of the latter.

* Goulard's extract of saturn.

If the scab should at any time be prematurely rubbed off, the part may be occasionally touched with the undiluted *aqua lythargyri acetati.*

Vaccine virus, taken from a pustule, and inserted immediately in its fluid state, is preferable to that which has been previously dried; but as it is not always practicable to obtain it in this state, we are compelled to seek for some mode of preserving it. Various means have been suggested, but from the test of long experience it may be asserted, that preserving it between two plates of glass is the most eligible. Let a piece of common window glass be cut into squares of about an inch each, so that they shall lie smooth when placed upon each other. Let the collected vaccine fluid be confined to a small spot (about the size of a split pea) upon the centre of one of these glasses; which should be suffered to dry in the common heat of the atmosphere, without exposure to the heat of fire or the sun. When dry, it should be immediately secured by placing over it the other piece of glass. Nothing more is necessary for its preservation than wrapping it in clean writing paper.

The virus, thus preserved, when wanted for the purpose of inoculation, may easily be restored to its fluid state by dissolving it in a small portion of cold water, taken upon the point of a lancet. It may then be used in the same manner as when just taken from a pustule.

The vaccine fluid is liable, from causes apparently trifling, to undergo a decomposition. In this state it sometimes produces what has been denominated the spurious pustule; that is, a pustule, or an appearance on the arm not possessing the characteristic marks of the genuine pustule. Anomalies, assuming different forms, may be excited, according to the qualities of the virus applied, or the state of the person inoculated; but by far the most frequent variety, or deviation from the perfect pustule, is that which arrives at maturity, and finishes its progress much within the time limited by the true. Its commencement is marked by a troublesome itching; and it throws out a premature efflorescence, sometimes extensive, but seldom circumscribed, or of so vivid a tint as that which surrounds the pustule completely organized; and (which is more characteristic of its degeneracy than the other symptoms) it appears more like a common festering produced by a thorn, or any other small extraneous body sticking in the skin, than a pustule excited by the vaccine virus. It is generally of a straw colour; and when punctured, instead of that colourless, transparent

fluid of the perfect pustule, its contents are found to be opaque. That deviation from the common character of the pustule, arising from vaccine virus which has been previously exposed to a degree of heat capable of decomposing it, is very different. In this instance it begins with a creeping scab, of a pale brown or amber colour, making a long and slow progress, and sometimes going through its course without any perceptible efflorescence. Its edges are commonly elevated, and afford, on being punctured, a liquid fluid.

A little practice in vaccine inoculation, attentively conducted, impresses on the mind the perfect character of the vaccine pustule; therefore, when a deviation arises, of whatever kind it may be, common prudence points out the necessity of re-inoculation; first, with vaccine virus of the most active kind; and, secondly, should this be ineffectual, with variolous virus. But if the constitution shews an insusceptibility of one, it commonly does of the other.

When any constitutional symptoms occur in inoculated Cow-pox, they are commonly first perceptible (especially in children) on the fourth or fifth day. They appear again, and sometimes in adults, not unlike a mild attack from inoculated small-pox, on the eighth, ninth, or tenth day. The former arise from the general effects of the virus on the habit, the latter from the irritation of the pustule.

If the effluvia of the small-pox have been received into the habit previously to the inoculation of the vaccine virus, the vaccine inoculation will not always be found to stop its progress, although the pustule may make its advances without interruption.

The lancet used for inoculation should always be perfectly clean. After each puncture, it is proper to dip it into water, and wipe it dry.

The preservation of vaccine virus upon a lancet beyond the period of a few days, should never be attempted; as it is so apt to produce rust, which will decompose it.

EDWARD JENNER.

ARTICLE II.

Beneficial Effects of Digitalis Purpurea.

THE powerful effects of the digitalis have so much engaged, of late, the attention of the medical part of the world, that we may confidently expect its real merits in the cure of

diseases will, ere long, by a liberal communication from those who employ it, be duly ascertained. Its power over the arterial system is so decided, as to lead to the rational conclusion, that, by attentive, cautious, and judicious management, much good may be done with it; and we know, from the numerous communications which, through the medium of your excellent Journal, have been given to the world, that it may be administered with safety and effect. I have not been inattentive to its operations, and have been enabled, by its use, to afford very considerable relief to many patients in anasarcas and coughs, but in no instance with more clear and decided effect than in acute rheumatism. It is a disease which, in the course of my practice, I have had numerous opportunities of seeing, and can bear ample testimony to the difficulty in removing it, and to the length of time necessary for that purpose. I have principally relied on large and repeated bleedings early in the disease, and have ever found them effectual, joined with an antiphlogistic regimen; but the debility which, for the most part, succeeds such a mode of treatment, is a matter of serious consideration; and if a medicine can be discovered which, by its effect on the arterial system, will supersede the necessity of bleeding, or even diminish, in any degree, that necessity, it will be a valuable discovery: for it must be allowed that the loss of so large a quantity of blood as has frequently been found necessary to remove the disease, must have a very decided effect on the constitution, and not unfrequently lays the foundation of irremediable mischief. Having reflected much on these circumstances, and considered the wonderful power which the digitalis possesses of diminishing the action of the heart and arteries, I was determined to employ it in the first fully formed case I should meet with. Two cases occurred nearly at the same time, one only of which I shall relate, as the treatment and event were the same in both.

On the 15th of February, 1801, I was desired to visit T. B. a robust, healthy looking man, in the prime of life, of a florid complexion and sanguine temperament. He had been seized, on the 11th, with rigors, succeeded by fever and very great pain. I found his hands, knees, feet and shoulders much swelled, very red and inflamed, hot to the touch, and extremely painful, and he was totally incapable of moving himself. The skin felt very hot, was rather moist, and emitted that acid effluvia so peculiar to this disease, and which, from long experience, having found to be a constant

attendant, I consider as a characteristic symptom. His tongue was slightly furred, white, and rather moist: he complained of a considerable degree of thirst, and could not get any sleep. The urine was exceedingly high-coloured, and deposited a copious pink sediment, an appearance I have invariably observed in this disease. The pulse was full, hard, and beat 112 in a minute. I ordered him ten drops of the tinct. digitalis every six hours, and a strict antiphlogistic regimen.

My professional engagements prevented me from seeing him every day, as he lived some distance from me; it was therefore on the 17th I found that the pain, swelling, and inflammation of the joints, had in no wise diminished, and the tongue and the skin were in the same state as before. Indeed, the thirst was in some degree lessened, the urine not so high-coloured and turbid, and the pulse reduced to 104. Not having had any sleep, a draught with tinct. opii, gt. xxx. was ordered at night, and the dose of tinct. digitalis increased to fifteen drops.

I was much pleased on the 19th to find the pain, inflammation, and swelling, in both knees, so much abated as to enable him to move them freely. The feet and one hand were much better; the other hand and both shoulders in much the same state as before, as was also the tongue and urine; the skin moist and much cooler, and the pulse 80. The opiate had procured him a good night, which was repeated, and the tinct. digitalis continued. Not having had stools, a draught with infus. sennæ was ordered.

The pain, inflammation and swelling, on the 21st, was confined to the right arm, all the other parts being entirely free; the heat much diminished, the skin moist, the urine the same, and the pulse 80. He complained of a slight head-ach, which, however, lasted but a short time. The opening draught had produced two stools; but, not having slept, the tinct. opii was increased to forty drops, the tinct. digitalis continued.

On the 23d the redness and swelling had entirely disappeared, though a considerable degree of pain was felt in the knees and shoulders, accompanied with much weakness. The skin was cool, and both that and the tongue moist; the urine much paler, and without the copious pink-coloured sediment noticed in the beginning. The pulse 84. He had not had much sleep, and no motion; the aperient draught was therefore repeated, the opiate omitted till that had operated, and the tinct. digit. continued as before. I found he had not been so punctual in

taking his medicine for the last two days as he ought. He passed the 24th and 25th much better; but having again omitted his medicine, I found, on the 26th, that he had a return of pain, swelling, and inflammation in the right hand and foot. The pulse was at 84, and the skin cool and moist.

By the 28th, when I again saw him, the swelling was almost entirely subsided, without the least appearance of inflammation or fixed pain; the little pain he *did* feel was slight and wandering. The skin continued cool and moist, the urine was much paler, the bowels open, the appetite returning, and he had comfortable sleep. I now ordered him mutton broth, calve's-foot jelly, and sago, and reduced the tinct. digit. to three times in a day.

On visiting him March 1, I found, to my surprise, that the pain and swelling had returned into one hand, and, on the 3d, that it had extended to the other. The next day (4th) the symptoms were become considerably aggravated; and, on inquiry, I discovered that he had very imprudently, and contrary to my express directions, drank several glasses of mead. The tongue, though moist, had become brown, the skin hotter, and the pulse 92. He complained of head-ach and want of sleep, and was so sensible of his imprudence in deviating from my directions, that he was determined to follow them implicitly in future. I increased the dose of tinct. digit. to twenty drops.

The pain and swelling on the 7th were less, and every symptom favourable; the pulse 96. The tinct. digit. was increased to twenty-five drops.

On the 10th I was happy to find every vestige of inflammation entirely vanished; he had neither pain nor swelling any where; his appetite was good, the pulse 88, and the urine now deposited a copious lateritious sediment. From this time none of his complaints returned; the drops were reduced to ten, three times in a day; he soon recovered his former state of health, and has maintained it to this day, except occasional slight erratic pains, which rheumatic patients are for the most part subject to in cold weather.

I must here beg leave to direct your attention to the leading circumstances of this case. The symptoms, undoubtedly, indicated an high phlogistic diathesis; and I am perfectly convinced, that had blood been drawn, its appearance would have fully confirmed my opinion: yet was this disease, in general, so obstinate a one, checked in the short space of five days after the exhibition of the digitalis; and for the next six, the pro-

gress towards health was considerable. And it cannot escape your observation, that on the medicine being omitted the symptoms increased; but by afterwards duly persisting in its use, the disease was finally eradicated in little more than three weeks from the time I first saw him; and this was effected without one bleeding, or the exhibition of a single grain of nitre or antimony. I cannot conclude this case without observing, that it was as severe a one at its commencement as any I ever saw.

My patient informed me, that some years ago he was confined, in the same complaint, to his bed *seventeen weeks*, during which space he was bled *nine or ten times*.

It may not be improper to add, that the tincture I used was in the proportion of an ounce of the leaves recently dried and powdered to five of spt. of wine, and was prepared under my own inspection, with the most accurate attention. The leaves were gathered in the month of August, from vigorous, healthy plants, five or six feet high, growing on an elevated situation, and in a light sandy soil.

EDM. PITTS GAPPER.

Ewell, Surry, Jan. 8th, 1802. [*Med. & Phys. Journal.*

ARTICLE III.

Observations *respecting* Louisiana *and the* Western Countries *adjoining the* Mississippi. *Made during a Visit to the City of New-Orleans, in the Year* 1801.

By John Pintard, *Esq.*

THE Mississippi, pronounced by the natives *Meschasipi*, after a course of 3000 miles, and receiving the tributary streams of the immense rivers Missouri, Cumberland, Tennessee, Ohio, and many others; all which, the St. Laurence excepted, far surpass, in extent and magnitude, every river that empties into the Atlantic, disembogues through several channels into the Gulf of Mexico, in N. lat. 29. 9. and 89. 10 W. long. from Greenwich.

The approach to this river, by sea, is known by an instant change in the colour of the water, from black or dark sea-green to whitish, next clayey, and, lastly, a very muddy, frothy water, with soundings from 70 to 50 fathoms, at about ten leagues from the coast, gradually diminishing to four fathoms at the distance of three leagues, when the water be-

comes abruptly more discoloured and yellow. Directly off the mouth of the river the water resembles dirty soap-suds: every change of colour is strongly distinguished; you pass through one to the other in an instant. The water at the mouth of the river is quite fresh. The pilots drink it, scooping it up in their hands, the usual mode of allaying thirst by all who navigate this immense river.

The entrance of the river is very difficult, there being no landmarks along the coast, which is very low, and scarcely discernible at four leagues distance. Should a vessel fall in with the land on either side of the narrow prolongation of the continent through which the Mississippi passes into the Gulf of Mexico, she will, in all probability, get embayed, and be obliged to wait a change of wind several days to beat out. This circumstance very frequently happens.

The shores along the coast are lined with innumerable trees, which are wafted, and are constantly floating down the Mississippi. The appearance is not unlike a vast mast and spar yard. The trees are very large, and on reaching the mouth of the river, are driven ashore by the winds and tides: some are carried out to sea, and are to be met with at a great distance from land. These trees accumulating, become a mound, which arrests the muddy sediment of the river, and, in process of time, form numerous small islands, which constantly increasing and uniting, at length become part of the continent. This new land is first covered with bulrushes—then with bushes resembling alders, and, lastly, with ash and other forest trees. The whole country bordering on the mouth of the Mississippi has been thus made; and the probability is, that all the land on both sides the river, from the Ibberville downwards, a distance between two and three hundred miles, has originated from the alluvions and deposits of this muddy stream. It must require a considerable time ere this new land can become useful. Where the present Balise is erected, the ground was so low, that earth was brought to elevate the foundation for the Beacon, Guard and Pilot-houses. The site of the old Balise, which was built in 1734, at the mouth of the river, is now more than two miles above. The present Balise was constructed in 1766, by Don Antonio d'Ulloa, on a small island near the south-east entrance of the river, of which, about thirty years before, there was not the least appearance. In conversation with an experienced officer in the Spanish navy, a colonist of Louisiana, on the subject of this prolongation of the continent, he informed the writer of these observations, that

in the summer of 1800 he remarked a new island at the mouth of the river. That not many years ago, when laying at Point La Hache, between the Balise and New-Orleans, a seaman died on board his ship—they sent on shore to make a grave, but could not find sufficient firm earth to bury him. This place has since become solid land. He could also recollect when Plaquemines, where the fort now stands, was all a quagmire. M. Vaudreuil, formerly Governor of Louisiana, in a letter dated September 21, 1752, remarks, "There is infinite difficulty in settling towards the mouth of the river Mississippi, on account of the immense expense in banking against the inundation of the sea and land floods. I am against settling it as yet; and for waiting until the ground be more and more raised by the accretion of soil, as it hath been *three feet* within the space of fifteen years."

Every thing concurs to show that this river has enlarged the continent nearly one hundred leagues. Not a single stone, not even a pebble is to be found in all this new-made ground. The sea repelling that prodigious quantity of mud, leaves, boughs and trunks of trees, which the Mississippi is constantly washing down; all these materials continually pushed backward and forward, collect and bind themselves in a solid mass, which thus tends to prolong this vast continent. Another striking singularity, no where else to be met with, is, that the waters of this great river, when once they overflow its banks, never return within its bed again. The reason is this:—The Mississippi is annually swelled by the melting of the snows in the north, which begins in March, and continues about three months. This river lies very deep at the upper part, and does not overflow on the east side till within one hundred leagues of its mouth; that is to say, on the low lands supposed to be new ground. These muddy grounds, like all others which have not yet acquired their due consistence, bear a prodigious quantity of large reeds, which stop and entangle all extraneous bodies that are washed down the river. The collection of all these fragments, with the slime that fills up the intermediate spaces, raises, in process of time, the banks higher than the adjacent ground, so that the waters once overflowed, are prevented, by this obstacle, from the possibility of returning into their natural channels, and are therefore compelled to force an outlet into the sea by other courses. The new land and islands at the mouth of the Mississippi are said to rise and fall with the swelling and abating of the waters. This story, however, wants confirmation.

From the astonishing length of the Mississippi, and the vast bodies of water which flow into it, one is led to imagine that it must consequently be proportionably broad. Every traveller is much surprised to find the direct contrary. Instead of entering an open, extensive bay, the mouth of the river is very narrow and contracted; and through its whole course to New-Orleans, after passing La Loutre, it scarcely exceeds half a mile in breadth. Opposite the city the river takes a considerable sweep, forming a beautiful crescent, along which New-Orleans is situated. At this place it may be about three quarters of a mile wide. The levée, or imbankment which defends the town from the inundation of the Mississippi, is elevated about three feet above the surface of the country, over which the freshets seldom or never rise. The difference between the greatest height and lowest ebb of the river is somewhere about fourteen feet perpendicular. The last two years the Mississippi had risen so very inconsiderably as to have excited much surprise, and some idle conjectures that the waters of the Missouri had found a new channel to the ocean. This river it is which raises the former, and discolours its stream; for before its junction with the Missouri it is as clear and limpid as the Ohio. The latter, although subject to great freshets, has but little effect on the Mississippi. The water of this river, notwithstanding its being exceedingly turbid, is, nevertheless, very palatable and wholesome. It is used entirely at New-Orleans for drinking and culinary purposes, the well water being very indifferent. It is carted through the city in the same manner as the New-York tea-water, and sold at the rate of a penny a bucket, or half a dollar a hogshead: deposited in large earthen jars, it becomes, after reposing, of a milky colour, and is thus used. When filtered it is as clear as crystal; to drink it in this state is a luxury not commonly enjoyed in New-Orleans. This river water is quite cool, and though used at all times, and in the highest state of perspiration, by the boatmen and labourers, no ill consequences ensue; its salubrity is such, that the inhabitants who constantly use it are said never to be afflicted with that excruciating disorder the gravel, nor to be troubled with that loathsome infection the itch.

END OF THE FIFTH VOLUME.

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